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Vol. 969 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

PATENTS

April 25, 1978

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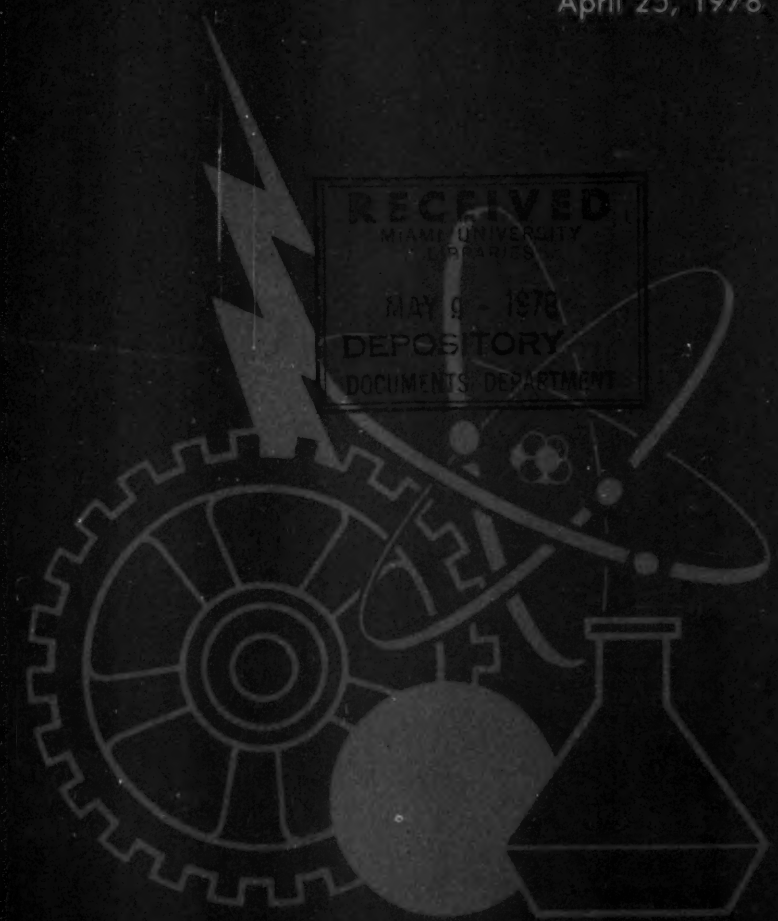

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

April 25, 1978 Volume 969 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of March 1978

Affirmed	186
Affirmed in part	18
Reversed	91
Total	295

October–December 1977 Classification Orders

The reclassifications covered by the following classification changes became effective between October and December 1977.

	Class	Subclasses
Classification Order 605, effective October 7, 1977:		
Abolished	526	48; 349; 350.
Established	526	47.1–47.9; 48.1–48.4; 52.1–52.5; 169.1–169.3; 229.5; 230.5; 232.1; 232.3; 232.5; 328.5; 329.1–329.7; 340.1–340.4; 344.1–344.3; 347.1; 347.2; 348.1–348.8; 352.2. Cross reference art collection. 918–923.
Position change	526	329.
Title change	526	230.
Classification Order 606, effective November 4, 1977:		
Abolished	240	All.
Established	2	209.2.
	33	348.2.
	(New) 362	1–458. Cross reference art collection. 800–812.
Classification Order 607, effective November 10, 1977:		
Established	206	Cross reference art collection. 830.
Classification Order 608, effective November 16, 1977:		
Abolished	235	150–198.
Established	235	301; 302; 302.1–302.4; 303; 303.1–303.4; 303.41; 303.42; 304; 304.1; 304.2; 306–309; 312; 310; 311.
	364	100–121; 400–527; 550–582; 600–608; 700–788; 800–864.
Classification Order 609, effective December 1, 1977:		
Abolished	73	67; 67.1–67.9; 69; 70; 70.1; 70.2; 71; 71.1–71.7; 552–561.
Established	73	570–672. Cross reference art collection. 900; 901.
Classification Order 610, effective December 27, 1977:		
Abolished	324	34; 36–48.
Established	324	200–263.
Classification Order No. 611, effective December 28, 1977:		
Abolished	259	All.
Established	(New) 366	1–349. Cross reference art collection. 600–607.

ALFRED C. MARMOR,
Administrator for Documentation,
January 17, 1978.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,925,719, Robbins and Linn, REFRIGERATING PACKAGE, **filed** Oct. 17, 1977, D.C. Conn. (New Haven), Doc. N–77–402, *Kay Laboratories, Inc.* v. *Hospital Marketing Services Co., Inc.*

2,937,940, Weisberg and Butler, SELECTIVE STRIPPING OF ELECTROPLATED METALS; **3,102,808,** same, COMPOSITION FOR SELECTIVELY STRIPPING ELECTROPLATED METALS FROM SURFACES, **filed** Oct. 11, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3750, *Philip A. Hunt Chemical Corporation* v. *Rin Inc. and Richard Wilczek.*

3,007,590, Mathew and Chapman, SHOVEL LOADERS, **filed** Oct. 13, 1977, D.C., M.D. Fla. (Tampa), Doc. 77–0844–C T.K., *Matbro (Canada), Limited* v. *J. I. Case Company, Inc., doing business as Case Power and Equipment.*

3,091,312, Woody, Scott and Jones, VEHICLE MOUNTED DERRICK, **filed** Oct. 19, 1977, D.C. N.D. Fla. (Pensacola), Doc. PCA 77–0548, *Lex Tex Ltd., Inc.* v. *Monsanto Textile Company.*

3,102,808. (See 2,937,940.)

3,117,657, S. J. Bruno, SHOWER ENCLOSURE, **filed** Oct. 21, 1977, D.C.N.J. (Newark), Doc. 77–2179, *R. B. Wyatt Manufacturing Co., Inc.* v. *Thermasol Ltd.*

3,147,853, R. L. Van Huis, CORNER POST ASSEMBLY; **3,185,289,** Kurtz and Graves, BELT CONVEYOR AND SAFETY MECHANISM THEREFOR; **3,707,141,** Boer and Van Huis, CAPSTAN CABLE DRIVE; **3,768,442,** R. L. Van Huis, MULTITIER CAGE CONSTRUCTIONS; **Re. 27,035,** same, FEED SAVER FOR AUTOMATIC FEED APPARATUS, **filed** June 17, 1977, D.C., E.D. Pa. (Philadelphia), Doc. 77–2143, *Big Dutchman Division of U.S. Industries, Inc.* v. *Favorite Manufacturing, Inc.*

3,183,623, E. Callen, TOY BOMBS, **filed** Oct. 11, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3776, *Callen Manufacturing Corporation* v. *Chemtoy Corporation.*

3,185,289. (See 3,147,853.)

3,202,308, A. L. Botkin, CLOSURE LINERS; **3,363,305,** A. L. Botkin, METHOD OF MAKING A SCREW CAP LINER AND ASSEMBLING SAME IN A SCREW CAP, **filed** Oct. 4, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3688, *Albert L. Botkin* v. *Brown Company, Selig Sealing Products Inc. and Koops Kaps Inc.*

3,225,799, Hayden and Tanner, LUMBER SAWING ATTACHMENT FOR PORTABLE CHAIN SAW; **3,366,150,** W. Malloff, SAW CHAIN, **filed** Oct. 6, 1977, D.C.N.J. (Newark), Doc. 77–2090, *Granberg Industries, Inc.* v. *Robert Sperber and Sperber Tool Works, Inc.*

3,230,675, Frommelt and Frommelt, DOCK PADS WITH ADJUSTABLE HEAD PAD; **3,352,314,** same, LOADING DOCK SHELTER; **3,538,655,** same; **3,557,508,** same, **filed** May 12, 1975, D.C., W.D.N.Y. (Buffalo), Doc. C–75–178, *Dubuque Awning & Tent Company* v. *Weather-Shield Corporation.* Stipulation and order filed dismissing all claims in the action with prejudice, Sept. 26, 1977.

3,351,707, Dreyfoos and Mergens, ELECTRONIC COLOR VIEWER; **3,471,740,** same, METHOD AND APPARATUS FOR CONTROLLING CATHODE RAY TUBE BRIGHTNESS AND CONTRAST, **filed** Oct. 7, 1977, D.C. Calif. (San Francisco), Doc. C–77–2268 RFP, *Photo Electronics Corporation* v. *Avery and Anna Rockfeller.*

3,352,314. (See 3,230,675.)

3,366,150. (See 3,225,799.)

3,383,487, R. Wiener, THIN FLEXIBLE MAGNETIC; **3,860,771,** Lynn and Seeger, KEYBOARD SWITCH ASSEMBLY WITH SAME SHAPED ACTUATOR HAVING ASSOCIATED UNDERLYING CONTRACTOR MEANS, **filed** Dec. 21, 1976, D.C. Conn. (Hartford), Doc. H76–499, *Rogers Corporation* v. *Chomerics, Inc.*

3,386,705, G. D. Griffin, COMPOSTING MACHINE; **3,791,593,** same, FORM OF TINED SHAFT AND CONSTRUCTIONS OF COMPOSTING MACHINE, **filed** Sept. 29, 1977, D.C., E.D. Pa. (Philadelphia), Doc. 77–3349, *Gordon D. Griffin* v. *Keystone Mushroom Farm, Inc.*

3,421,293, J. H. C. Halls, PAINT SPRAY BOOTHS, **filed** Oct. 21, 1977, D.C., E.D. Mich. (Detroit), Doc. 77–72528, *Schweitzer Industrial Corp.* v. *Binks Manufacturing Co.*

3,471,740. (See 3,351,707.)

3,538,655. (See 3,230,675.)

3,557,508. (See 3,230,675.)

3,557,644, G. W. Gregory, SQUEEZE ACTION WRENCH; **3,616,714,** same, RACK AND PINION SQUEEZE ACTION WRENCH, **filed** Oct. 7, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3763–DWW, *Gerrett W. Gregory* v. *Consumer Tool Co.*

3,616,714. (See 3,557,644.)

3,674,175, J. Jaquish, MULTIPLE SIZE PACKAGE DISPLAY AND DISPENSER, **filed** Oct. 3, 1972, D.C., S.D.N.Y., Doc. 72–C–4203, *Transworld Display* v. *Mechtronics Inc.*

Judgment, said patent is invalid and void and of no force and effect. The complaint is dismissed with prejudice, Oct. 11, 1977.

3,675,891, Reynolds, Pannier and Sorenson, CONTINUOUS CATHETER FLUSHING APPARATUS, **filed** Oct. 20, 1977, D.C., N.D. Tex. (Dallas), Doc. 3–77–1393F, *Sorenson Research Co. Inc.* v. *Jay Bruton Medical Electronics, Inc.*

3,707,141. (See 3,147,853.)

3,709,556, Allard and Allard, TELESCOPING I V POLE ATTACHMENT AND WHEEL, **filed** Sept. 23, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV–3562–MML, *Sana Products, Inc.* v. *Everst & Jennings International et al.*

3,768,442. (See 3,147,853.)

3,770,156, G. Yates, Jr., TAMPER PROOF CLOSURE, **filed** July 17, 1975, D.C., N.D. Ill. (Chicago), Doc. 75c2378, *Park Ohio Industries* v. *Growth International Industries.* Filed stipulation to dismiss under Rule 41 F.R.C.P., Oct. 19, 1977.

3,791,593. (See 3,386,705.)

3,831,788, A. E. Erlinder, LIFT HAVING SELF-FOLDING PLATFORM, **filed** Oct. 14, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3838, *Jane Erlinder Nesius* v. *Ontario Equipment Inc.*

3,851,914, T. Nii, COLLAPSIBLE CHAIR, **filed** Oct. 18, 1977, D.C., N.D. Ill. (Chicago), Doc. 77c3868, *Takeshi Nii and Trend Pacific Inc.* v. *Ida Stein & Associates and Intal Trade Inc.*

3,860,771. (See 3,383,487.)

3,873,884, F. C. Gabriel, ELECTRODELESS DISCHARGE LAMP AND POWER COUPLER THEREFOR, **filed** Sept. 27, 1977, D.C., E.D.N.Y.. (Brooklyn), Doc. 77–c–1923, *Perkin-Elmer Corporation* v. *Westinghouse Electric Corporation.*

3,874,258, Semola and Droesbeke, KEYED ATTACHMENT DEVICE FOR VEHICLE WHEELS, **filed** July 6, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2489–RJK, *Stallion Enterprises Inc.* v. *Kyo-Ei American Corporation et al.* Judgment upon default and order thereon enjoining defendants from further violations of plaintiff's patent, entered Oct. 19, 1977.

3,968,989, R. Schippers, ENCLOSURE STRUCTURE, **filed** Oct. 17, 1977, D.C., E.D. Tenn. (Knoxville), Doc. C–3–77–379, *Ronald Schippers* v. *Midas International Corp.*

3,990,115, D. G. Nester, ROLL TOP CUFFLESS SOCK AND METHOD OF FORMING SAME, **filed** Oct. 17, 1977, D.C., M.D. N.C. (Winston-Salem), Doc. C–77–497–WS, *Ridgeview Mills, Inc.* v. *Renform Corporation.*

4,003,571, W. U. Nipper, Jr., ROCKING DEVICE; **D. 243,469,** same, ROCKING TOY, **filed** June 27, 1977, D.C. Ala. (Birmingham), Doc. CA77–L–0882–NE, *Pixieland, Inc.* v. *Carl Duke, doing business as C.D. Rock-It-Ride, C.D. Lights Company, and Southern See-Saw.*

4,021,055, M. C. Okland, VEHICLE RUNNING BOARD, **filed** Oct. 17, 1977, D.C., S.D. Iowa (Des Moines), Doc. 77–301–2, *Tafco Equipment Co., doing business as Tafco Fabrication Division* v. *Scott Ankeny and Denny Elwell Payless Tire Co., Inc.*

Re. 27,035. (See 3,147,853.)

D. 243,217, E. E. Warsaw, SOFA, **filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–1016–RF, *Sheffield Furniture Corp.* v. *Sofa Line.* Stipulation to consent judgment and order thereon permanently enjoining and restraining defendant from further violation of plaintiff's patent. Aug. 25, 1977. **Same,** filed Mar. 31, 1977, D.C. Ariz. (Phoenix), Doc. C–77–260 PhX, *Sheffield Furniture Corp.* v. *Continental Furniture Mfg. Co.* Consent judgment in favor of plaintiff granting injunctive relief, June 6, 1977. **Same, filed** June 6, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–2037–F, *Sheffield Furniture Corp.* v. *Superb Furniture, Inc.* **Same, filed** Oct. 31, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–4077–IH, *Sheffield Furniture Corp.* v. *Trendline, Inc.*

D. 243,330, K. Pichler, EYEGLASS FRAME, **filed** Sept. 27, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–3630–WPG, *Optyl Corp.* v. *G. Hundert, etc.* **Same, filed** Sept. 27, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–1917, *Optyl Corporation* v. *Meadows-Bud Optical Co., Inc.* **Same, filed** Sept. 29, 1977, D.C. Conn. (Bridgeport), Doc. B–77–313, *Optyl Corporation* v. *Welling International Corp.* **Same, filed** Oct. 12, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–2020, *Optyl Corporation* v. *Coronet Optical Co. Inc.*

D. 243,330, K. Pichler, EYEGLASS FRAME; **D. 245,169,** E. Teufelhart, **same, filed** Sept. 26, 1977, D.C., E.D.N.Y. (Brooklyn), Doc. 77–C–1900, *Optyl Corporation* v. *H.S. Optical Products Corp. and Harry Sherman, doing business as Rugby Optical Co.*

D. 243,469. (See 4,003,571.)

D. 245,169. (See D. 243,330.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,224,035, Re. S.N. 884,667, Filed Mar. 8, 1978, Cl. 16/163, HINGES, Richard Heinze, Sr. (deceased), by Richard Heinze, Jr. (heir), Owner of Record: *Inventor,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 352

3,391,420, Re. S.N. 880,221, Filed Feb. 21, 1978, Cl. 16/142, HINGE, Lloyd L. Anderson, Owner of Record: *Amerock Corporation, Rockford, Ill.,* Attorney or Agent: C. Frederick Leydig, Ex. Gp.: 353

3,459,070, Re. S.N. 875,265, Filed Feb. 6, 1978, Cl. 74/705, WHEEL DRIVE MECHANISM, John W. Holdeman, Owner of Record: *Borg-Warner Corporation, Chicago, Ill.,* Attorney or Agent: Donald W. Banner, Ex. Gp.: 345

3,748,079, Re. S.N. 852,363, Filed Nov. 17, 1977, Cl. 425/466, DOUGH SHEET SPREADER, Edward F. Ruiz, Owner of Record: *Inventor,* Attorney or Agent: Edward O. Ansell, Ex. Gp.: 322

3,941,149, Re. S.N. 875,343, Filed Feb. 6, 1978, Cl. 137/493.1, VALVE, Herbert Mittleman, Owner of Record: *Baxter Laboratories Inc., Morton Grove, Ill.,* Attorney or Agent: Paul C. Flattery, et al., Ex. Gp.: 341

3,943,343, Re. S.N. 883,351, Filed Mar. 3, 1978, Cl. 235/151.11, PROGRAM CONTROL SYSTEM FOR MANIPULATOR, Akiyoshi Irie, Owner of Record: *Inventor,* Attorney or Agent: None, Ex. Gp.: 236

3,945,589, Re. S.N. 881,844, Filed Feb. 27, 1978, Cl. 244/30, AMPHIBIOUS DIRIGIBLE AIRSHIPS, George Crompton, Owner of Record: *Inventor,* Attorney or Agent: G. Lloyd Knight, Ex. Gp.: 315

3,970,907, Re. S.N. 876,195, Filed Feb. 8, 1978, Cl. 318/207 C, PULSATING TORQUE APPARATUS AND METHOD, Theodore F. Myers, Owner of Record: *Hobart Corporation, Troy, Ohio,* Attorney or Agent: Lawrence B. Biebel, et al., Ex. Gp.: 217

3,985,959, Re. S.N. 882,104, Filed Feb. 28, 1978, Cl. 235/153 AK, KEY TELEPHONE SYSTEM FOR SUBSCRIBERS, Shigeharu Komine et al., Owner of Record: *Oki Electric Industry Company, Tokyo, Japan,* Attorney or Agent: Henry N. Paul, et al., Ex. Gp.: 232

4,013,858, Re. S.N. 883,352, Filed Mar. 3, 1978, Cl. 200/321, ROCKER SWITCH WITH INTEGRAL OFF LOCK, Stuart W. Grebner, et al., Owner of Record: *Cutler Hammer, Inc., Milwaukee, Wis.,* Attorney or Agent: Hugh R. Rather, et al., Ex. Gp.: 241

4,030,625, Re. S.N. 881,841, Filed Feb. 27, 1978, Cl. 213/147 G, LOADER ATTACHMENT FOR HANDLING LOGS, BALES AND THE LIKE, Edward L. Koehnen, Owner of Record: *Inventor,* Attorney or Agent: L. Paul Burd, et al., Ex. Gp.: 314

4,035,479, Re. S.N. 869,472, Filed Jan. 16, 1978, Cl. 424/78, DELAYED AND SUSTAINED UREA RELEASE COMPOSITIONS, Henry H. George, Jr., et. al., Owner of Record: *Celanese Corporation, New York, N.Y.,* Attorney or Agent: Thomas J. Morgan, et al., Ex. Gp.: 125

4,040,900, Re. S.N. 881,843, Filed Feb. 27, 1978, Cl. 162/158, METHOD OF SIZING PAPER, Emil D. Mazzarella, et al., Owner of Record: *National Starch and Chemical Corporation, Bridgewater, N.J.,* Attorney or Agent: Harold James, et al., Ex. Gp.: 173

4,059,515, Re. S.N. 879,981, Filed Feb. 22, 1978, Cl. 210/54, PROCESS FOR CLARIFICATION OF OIL-CONTAINING WASTE, William J. Fowler, et al., Owner of Record: *Betz Laboratories, Inc., Trevose, Pa.,* Attorney or Agent: Alexander D. Ricci, et al., Ex. Gp.: 176

PATENT NOTICES

Certificates of Correction for the Week of Apr. 25, 1978

D. 245,308	4,041,185	4,054,503	4,063,811
D. 246,077	4,041,662	4,054,533	4,063,816
3,888,919	4,041,670	4,054,656	4,063,915
3,927,136	4,041,980	4,054,832	4,063,942
3,933,566	4,042,348	4,055,996	4,063,947
3,955,899	4,042,564	4,056,080	4,064,083
3,957,886	4,042,664	4,056,084	4,064,095
3,959,233	4,043,097	4,056,613	4,064,101
3,971,056	4,043,768	4,056,901	4,064,109
3,974,542	4,044,172	4,057,192	4,064,340
3,976,868	4,044,551	4,057,390	4,064,348
3,999,229	4,044,880	4,057,624	4,064,485
4,013,718	4,045,093	4,057,675	4,064,500
4,018,490	4,045,095	4,057,705	4,064,503
4,019,311	4,045,269	4,057,732	4,064,816
4,020,090	4,045,448	4,058,317	4,064,826
4,020,896	4,046,739	4,058,533	4,064,959
4,020,932	4,046,866	4,058,567	4,065,054
4,021,224	4,046,972	4,059,085	4,065,059
4,022,408	4,047,893	4,059,283	4,065,268
4,022,859	4,048,174	4,059,534	4,065,378
4,022,872	4,049,397	4,059,642	4,065,563
4,023,485	4,049,651	4,061,007	4,065,580
4,024,056	4,049,672	4,061,400	4,065,867
4,024,240	4,049,931	4,061,740	4,066,115
4,026,887	4,050,074	4,061,849	4,066,325
4,028,538	4,050,230	4,062,037	4,066,397
4,029,876	4,051,065	4,062,313	4,066,466
4,032,655	4,051,656	4,062,420	4,066,519
4,035,220	4,051,681	4,062,623	4,067,006
4,035,910	4,051,779	4,062,717	4,067,155
4,035,941	4,052,112	4,062,852	4,067,206
4,037,740	4,052,327	4,062,860	4,067,436
4,037,761	4,052,436	4,062,880	4,067,442
4,038,342	4,052,476	4,063,199	4,067,450
4,038,494	4,052,553	4,063,208	4,068,018
4,039,920	4,053,063	4,063,310	4,068,210
4,040,647	4,053,308	4,063,313	4,068,899
4,040,673	4,053,387	4,063,406	4,069,128
4,040,860	4,053,724	4,063,409	4,069,132
4,040,946	4,053,887	4,063,726	
4,041,013	4,054,248	4,063,765	

Disclaimers

3,730,566.—*John Kazmierski, Jr.*, Ringoes, *Benjamin Lawson, Jr.*, Somerset, *Craig Edward Thornton*, Flemington, and *Gerard Louis Verrelli, Jr.*, Manville, N.J. DUCT CONNECTOR. Patent dated May 1, 1973. Disclaimer filed Feb. 24, 1978, by the assignee, *Johns-Manville Corporation.*

Hereby enters this disclaimer to all claims of said patent.

4,032,951.—*John Christian De Winter*, Howell Township, *Robert Edward Nahory*, Lincroft, and *Martin Alan Pollack*, Westfield, N.J. GROWTH OF III-V LAYERS CONTAINING ARSENIC, ANTIMONY AND PHOSPHORUS, AND DEVICE USES. Patent dated June 28, 1977. Disclaimer filed Mar. 13, 1978, by the assignee, *Bell Telephone Laboratories, Incorporated.*

Hereby enters this disclaimer to claims 1, 5, 6, 7, 9 and 10 of said patent.

Service by Publication

Suvrat Kirtikar

In accordance with 37 CFR 1.47(b) (Rules of Practice in Patent Cases), notice is hereby given of the filing on February 27, 1975, of an application for patent entitled "Electrostatic Recorder With a Recording Head Which Floats on a Fluid Cushion" on behalf of Suvrat Kirtikar, whose last known addresses are: J 106 Wilber Hall, Stanford, Calif. 94305; P.O. Box 6829, Stanford, Calif. 94305; 609 Summerlea St., Shadyside, Pa. 15232; S–6 Samarpan, Ahmedabad-6, India; and % Sri Ram Chandra, Etmadpur, Agra, U.P., India. The application was made in compliance with 37 CFR 1.47(b) and 35 U.S.C. 118 by Varian Associates without execution by the said Suvrat Kirtikar.

Any action to be taken by the said Suvrat Kirtikar in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents and Trademarks.

Erratum

All reference to Patent No. 4,071,626 to Michael J. Green and Ho-Jane Shue of the United States for 7a-Halogeno-3, 20-Dioxo-1,4-Pregnadienes, Methods for their Manufacture, their use as Anti-Inflammatory Agents, and Pharmaceutical Formulations Useful Therefor appearing in the OFFICIAL GAZETTE of January 31, 1978 should be deleted since no patent was granted.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MARCH 25, 1978

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-12-77
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-16-77
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	7-25-77
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-25-77
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	4-14-77
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	12-27-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	10-1-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-9-77
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	9-23-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	12-27-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	5-10-76
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	2-28-77
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	7-14-77
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-16-77
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	3-9-77
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	5-18-77

Expiration of patents: The patents within the range of numbers indicated below expire during March 1978, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,973,519 to 2,977,597, inclusive
Plant Patents..... Numbers 2,032 to 2,039, inclusive

REISSUES

APRIL 25, 1978

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,616
HALOVINYLIDENE ARYLENE POLYMERS AND PROCESS FOR MAKING THE SAME

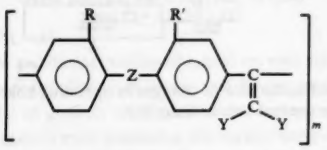
Tohru Takekoshi, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Original No. 3,824,214, dated Jul. 16, 1974, Ser. No. 343,139, Mar. 20, 1973. Application for reissue Mar. 18, 1977, Ser. No. 779,155

Int. Cl.[2] C08G *8/04, 8/28*

U.S. Cl. 260—52 **12 Claims**

1. A polymer composed of recurring units of the formula

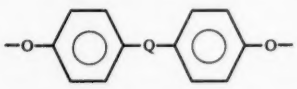


where R and R′ are members selected from the class consisting of hydrogen, halogen, and the methyl radical, Z is a direct bond or is a member selected from the class consisting of —O—, —S—, the

[O–{(CH$_2$)$_n$O}$_q$]

–O–{(CH$_3$)$_2$O}$_q$

radical, and divalent radicals of the general formula



where Y is chlorine or bromine, Q is a member of the class of —O—, —S—, —SO_2—, >C=O and divalent alkyl radicals of from 1 to 4 carbon atoms, m is a whole number in excess of 1, and [n and q are whole numbers from 1 to 2, inclusive] *q is a whole number equal to 1 or 2.*

Re. 29,617
ARYL METHYLENE POLYMERS PREPARED FROM CHLORAL, BROMAL OR GLYOXALIC ACID

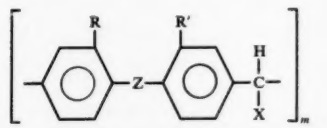
Tohru Takekoshi, Scotia, and Jimmy L. Webb, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Original No. 3,855,181, dated Dec. 17, 1974, Ser. No. 343,138, Mar. 20, 1973. Application for reissue Mar. 18, 1977, Ser. No. 779,154

Int. Cl.[2] C08G *8/04, 75/20, 75/23*

U.S. Cl. 260—49 **7 Claims**

1. A polymer composed of recurring units of the formula

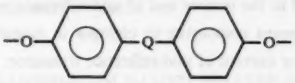


where R and R′ are members selected from the class consisting of hydrogen, halogen, and the methyl radical, X is a member selected from the class of —COOH and —CY_3 radicals, Z is a direct bond or is a member selected from the class consisting of —O—, —S—, the

[{(CH$_2$)$_n$O—}]

–O–{(CH$_3$)$_2$O}$_q$

radical, and divalent radicals of the general formula



where Y is chlorine or bromine, Q is a member of the class of —O—, —S—, —SO_2—,

>C=O

and divalent alkyl radicals of from 1 to 4 carbon atoms, m is a whole number in excess of 1, and [n and q are whole numbers from 1 to 2, inclusive] *q is a whole number equal to 1 or 2.*

Re. 29,618
SUPPRESSION OF CARDIAC VENTRICULAR FIBRILLATION AND CARDIAC ARRHYTHMIAS WITH BRETYLIUM TOSYLATE

Marvin B. Bacaner, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Original No. 3,441,649, dated Apr. 29, 1969, Ser. No. 573,209, Aug. 18, 1966. Application for reissue Mar. 28, 1977, Ser. No. 781,654

Int. Cl.[2] A61K *31/205*

U.S. Cl. 424—316 **13 Claims**

1. A method for suppressing cardiac ventricular fibrillation and cardiac ventricular arrhythmias in living beings which comprises administering bretylium tosylate to said beings in a small but effective amount at least sufficient to restore sinus rhythm.

Re. 29,619
CONSTANT-CURRENT DIGITAL-TO-ANALOG CONVERTER

James J. Pastoriza, Lincoln, Mass., assignor to Analog Devices, Incorporated, Norwood, Mass.

The portion of the term of this patent subsequent to Aug. 15, 1989 has been disclaimed.

Original No. 3,803,590, dated Apr. 9, 1974, Ser. No. 220,016, Jan. 24, 1972. Division of Ser. No. 809,700, Mar. 24, 1969, Pat. No. 3,685,045. Application for reissue Apr. 7, 1976, Ser. No. 674,749

Int. Cl.[2] H03K *13/04, 1/12*

U.S. Cl. 340—347 DA **13 Claims**

10. For use in signal-processing apparatus, such as a digital-to-analog converter, incorporating switchable current source means comprising a transistor having a collector, an emitter, and a base, and wherein the magnitude of current flow produced by such source is set by a resistor connected at one end to said emitter to carry the emitter current of such transistor, there being DC power supply means having a pair of output terminals connected respectively to the base of such transistor and to the remote end of said resistor to maintain a DC voltage differential therebetween, whereby to produce from the collector of such transistor an output current which is relatively unaffected by changes in load at the output of the current source;

that improvement for maintaining the output current of such current source *means* constant in the face of changes in

operating characteristics of such current-source transistor, comprising:

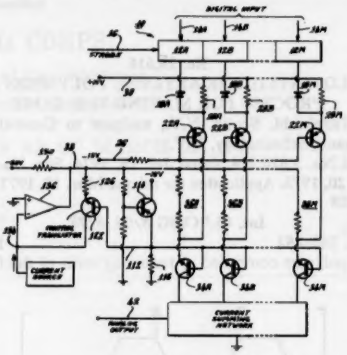
a reference transistor having a collector, an emitter and a base, said reference transistor being located adjacent said current source transistor and matched thereto;

a reference resistor connected at one end to the emitter of said reference transistor;

circuit means connecting said power supply means output terminals respectively to the base of said reference transistor and to the remote end of said reference resistor;

sensing means responsive to changes in magnitude of the collector current of said reference transistor; and

feedback voltage adjustment means under the control of said sensing means for automatically altering the DC voltage produced at said DC power supply output terminals as required to maintain constant the collector current from said reference transistor, thereby serving to continuously adjust the DC voltage applied to said current source transistor so as to maintain constant the collector current



thereof in the face of changes in operating characteristics of the current-source transistor.

PLANT PATENTS

GRANTED APRIL 25, 1978

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,243

ROSE PLANT

Herbert C. Swim, Ontario, and Arnold W. Ellis, Bakersfield, both of Calif., assignors to Armstrong Nurseries, Inc., Ontario, Calif.

Filed Apr. 13, 1977, Ser. No. 787,285
Int. Cl.[2] A01H *5/02*
U.S. Cl. Plt.—11 **1 Claim**

1. A new and distinct variety of hybrid tea rose, substantially as described and illustrated herein, and having a tall upright bushy habit of growth, with medium size to large glossy foliage and smooth erect peduncles, the variety being characterized especially in the bicolored flowers which it bears, these comprising petals of an orange color on their inner surfaces and a yellow reverse on their outer surfaces, said flowers having from 25 to 35 petals and from 1 to 5 petaloids disposed about approximately 90 pistils.

4,244

CHRYSANTHEMUM NAMED YELLOW JACKET

David Greinke, Bradenton, Fla., assignor to Pan-American Plant Company, West Chicago, Ill.

Filed May 16, 1977, Ser. No. 797,495
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—75 **1 Claim**

1. A new and distinct chrysanthemum cultivar substantially as herein shown and described, characterized by its abundant production of small, bright yellow blooms which appear in single flower form in a relatively open spray formation on a short, compact plant which has excellent breaking ability and abundant medium sized, dark green and glossy foliage.

PATENTS

GRANTED APRIL 25, 1978

ERRATA

For CLASS	See PATENT NO.
061–045 D	4,085,592
251–298	4,085,952
254–010 C	4,085,953
256–034	4,085,954
366–212	4,085,955
029–446	4,086,065
062–002	4,086,072
144–193 A	4,086,111
106–293	4,086,123
427–157	4,086,183
202–248	4,086,231
424–273 R	4,086,235
206–454	4,086,263
252–454	4,086,264
560–241	4,086,267
560–252	4,086,268
364–757	4,086,474
362–432	4,086,479
362–148	4,086,480
362–428	4,086,481
362–376	4,086,482
362–311	4,086,483
340–015.5 TS	4,086,504
337–102	4,086,558
365–036	4,086,570
365–012	4,086,572
354–023 D	4,086,581
354–033	4,086,582
354–038	4,086,583
354–062	4,086,584
354–115	4,086,585
363–037	4,086,621
363–037	4,086,622
363–041	4,086,623
363–127	4,086,624
364–104	4,086,625
364–200	4,086,626
364–200	4,086,627
364–200	4,086,628
364–200	4,086,629
364–410	4,086,630
364–416	4,086,631
364–444	4,086,632
364–474	4,086,633

PATENTS

GRANTED APRIL 25, 1978

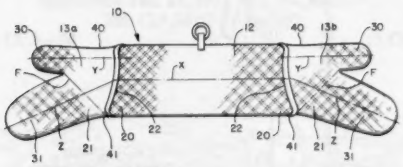
ERRATA

PATENTS

GRANTED APRIL 25, 1978

GENERAL AND MECHANICAL

4,085,464
DOUBLE OVEN MITT
Ely Simonoff, Wheeling, Ill., assignor to Opelika Manufacturing Corporation, Chicago, Ill.
Filed Nov. 5, 1976, Ser. No. 739,281
Int. Cl.[2] A41D *25/00*
U.S. Cl. 2—158 **2 Claims**



1. A double oven mitt fabricated of flexible heat-resistant material for handling a dish with an upper lip, comprising:

a. a pair of end hand mitts for receiving the left and right hands of a wearer, and

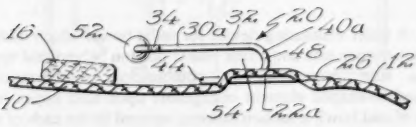
b. a band elongated on an axis and connecting said end hand mitts whereby the palm of each of said mitts is an extension of said band,

c. each of said end hand mitts including a thumb portion and a finger portion, wherein said thumb portion is formed coextensive the upper edge of said mitt,

d. the axis of each of said thumb portions normally extending substantially parallel to said connecting band axis,

e. the axis of each of said finger portions normally inclined downwardly at an angle to the axis of a corresponding thumb portion and the axis of said connecting band whereby each of said finger portions fold about a line in the palm of a correpsonding end hand mitt inwardly under a dish being grasped by the wearer to support the dish flat on its bottom without bunching up or otherwise distorting to prevent the wearer's grip from being uncomfortable and jeopardizing safe handling of the dish while said band engages and supports the circumference of the dish and said thumb portions and band underlie the upper lip of the dish.

4,085,465
SHOULDER STRAP GUARD
Clifford K. Brown, 5913 London Rd., Duluth, Minn. 55804
Filed Jan. 31, 1977, Ser. No. 764,160
Int. Cl.[2] A41D *27/22*
U.S. Cl. 2—271 **5 Claims**



1. A wire shoulder strap guard comprising a first pair of laterally spaced portions including straight sections, said first portions residing in one plane and having free pointed ends for insertion into the shoulder region of a garment, a second pair of laterally spaced portions including straight sections, said second portions residing in a second plane above said one plane and the spacing of said second portions being less than that of said first portions, and a third pair of portions including arcuate first sections curving inwardly from the straight sections of said first portions and residing in substantially said one plane, straight second sections also substantially in said one plane and extending in the general direction of said pointed ends but terminating in a spaced relation with respect to said pointed ends and arcuate third sections curving upwardly from said second straight sections to the straight sections of said second portions to maintain said second portions in said second plane, whereby a shoulder strap can be received under said second portions when said first portions have been inserted into the garment.

4,085,466
PROSTHETIC JOINT DEVICE
John William Goodfellow, Woodeaton; John Joseph O'Connor, Oxford, both of England, and Nigel Graham Shrive, NW. Calgary, Canada, assignors to National Research Development Corporation, London, England
Continuation-in-part of Ser. No. 633,034, Nov. 18, 1975, abandoned, which is a continuation-in-part of Ser. No. 632,824, Nov. 17, 1975, abandoned. This application Aug. 4, 1977, Ser. No. 821,905
Claims priority, application United Kingdom, Nov. 18, 1974, 49795/74
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **11 Claims**

1. A prosthetic joint device comprising:

a first component having a generally convex articulatory bearing surface;

a second component having a relatively flattened articulatory bearing surface compared to that of said first component;

and a third component having two articulator bearing surfaces in back-to-back disposition and of individual forms substantially complementary to said first and second component articulatory surfaces, said third component being located between said first and second components with the two pairs of said complementary surfaces freely slidably and individually non-captively engaged.

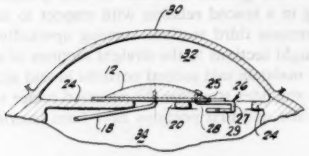
4,085,467
INTRAOCULAR LENS
Edgar A. Rainin, 5747 Tamarack Way, Concord, Calif. 94521, and Emery Major, 17 Skylark Dr., Larkspur, Calif. 94939
Filed Nov. 17, 1975, Ser. No. 632,834
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **10 Claims**

1. An intraocular lens device intended for insertion within the eye; the iris of the eye having at least an opening therethrough comprising:

a. lens portion intended for placement against a side of the iris, said lens portion adapted for covering at least a portion of the pupil;

b. means for stabilizing said lens portion, said stabilizing means affixed to said lens portion and intended to extend through the pupil of the eye to the side of the iris opposite that of said lens portion placement;

c. means for anchoring said lens portion intended for extending through the iris opening and affixed to said lens portion such that said lens portion lies over the pupil of the eye, said anchoring means comprising a member connected to said lens portion, said member having an intermediate portion intended for passing through the iris opening, said member having a terminus which is enlarged and has a dimension greater than the width of the iris opening.

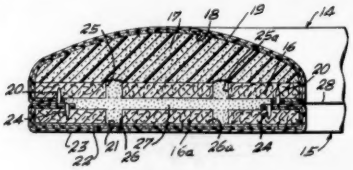


4,085,468

CUSHIONED TOILET SEAT ASSEMBLY

Abe Seiderman, 7365 SW. 132 St., Miami, Fla.

Filed Feb. 3, 1977, Ser. No. 765,084
Int. Cl.[2] A47K *13/02*
U.S. Cl. 4—237 **6 Claims**



1. A cushioned toilet seat member, comprising, in combination, a pair of substantially flat upper and lower base members, upholstery material covering the respective top and bottom of said upper and lower base members, a cushioning material interposed between said upholstery material and said upper base member said upholstery material comprising outer sheet material layers surrounding peripheral edge portions of their respective upper and lower base members and terminating in marginal portions overlapping the respective bottom and top of said upper and lower base members, means tacking said marginal overlapping portions to the bottom and top of said upper and lower base members, respectively, a plurality of aligned through openings in said upper and lower base members, and glue means for securing the respective bottom and top of said upper and lower base members in aligned, face-to-face engagement, said glue means comprising hardened glue extending through voids defined by aligned ones of said pluralities of openings to simulate riveting together of said upper and lower base members.

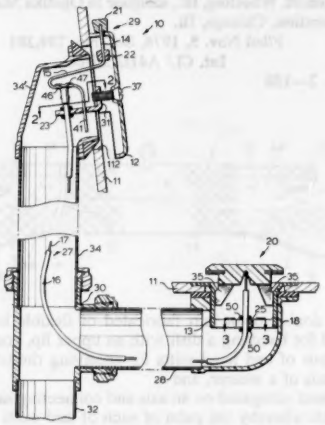
4,085,469

WASTE CONTROL WITH REPLACEABLE CABLE

Sigurdur G. Petursson, 2169 Linby Street, Mississauga, Ontario, Canada

Filed Sep. 15, 1976, Ser. No. 723,441
Int. Cl.[2] E03C *1/24, 1/22*
U.S. Cl. 4—199 **8 Claims**

1. In combination with a water fillable opentopped ablution receptacle having a drain pipe depending in sealed relation from a drain opening in the receptacle to connect with a drainage system when installed, a drain operating control having a handle secured to the receptacle, a flexible tube having one end secured in fixed relation adjacent said handle, clip means accessible through said opening removeably securing the remote end of said tube adjacent said drain opening, and a resilient cable having one end thereof removeably connected to said control handle, extending in slideable relation through said tube, the outside diameter of said cable being sufficiently smaller than the inside diameter of said tube, to permit bending



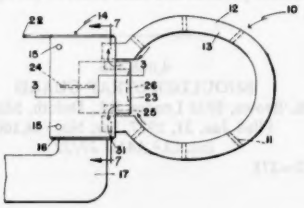
of the tube in a desired path conforming relation without entrapment of the cable therein, the other end of said cable extending upwardly from the tube being moveable vertically relative thereto in response to motion of said control handle to raise and lower a stopper located in flow controlling relation in said drain opening.

4,085,470

VENTILATED TOILET DEVICE

George Roberts, 2219 Edward Street, Regina, Canada

Filed Jan. 14, 1977, Ser. No. 759,421
Int. Cl.[2] E03D *9/04;* A47K *13/00*
U.S. Cl. 4—213 **6 Claims**



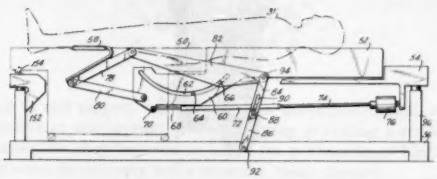
1. A toilet ventilating device for toilet bowls which include an upper open side and a rear planar portion behind said upper open side; comprising in combination a substantially horseshoe-shaped element engageable upon said upper open side of said bowl, a suction housing secured to the ends of said elements and engageable upon said rear planar portion; conduit means connected to said suction housing operatively connected to a source of negative air pressure, and air intake means in said suction housing connecting to the interior of said bowl when said device is in position upon said bowl, means to control the degree of communication between the interior of the bowl and the interior of the suction housing via said air intake means in said suction housing, said means to control the degree of communication including a drawer component slidably engaging within the front of said suction housing and extending into said suction housing, and means in said drawer component communicating between the interior of said suction

housing and said bowl, the degree of communication depending upon the position of said drawer component with said suction housing.

4,085,471
INVALID BED ARRANGEMENT

Paul L. DiMatteo, Huntington, and Henry V. Diaferia, Brentwood, both of N.Y., assignors to Dynell Electronics Corporation, Melville, N.Y.

Division of Ser. No. 685,415, May 11, 1976, which is a continuation-in-part of Ser. No. 544,710, Jan. 28, 1975. This application Jun. 15, 1977, Ser. No. 806,777
Int. Cl.² A61G *7/08, 7/02*
U.S. Cl. 5—90 **12 Claims**

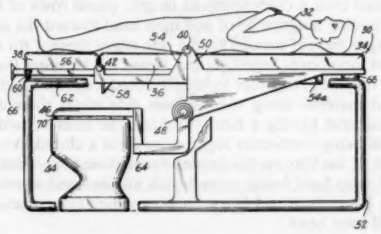


1. A method for transferring a person from a reclined position to a seated position comprising the steps of: supporting the back side of the person with the person's posterior at a first location; supporting the calves of the person; raising the calves of the person and bending the knees of the person; freeing substantially the posterior of the person, the weight of said person being directed away from said posterior during freeing thereof; returning said person to a reclined position; and lowering said person with posterior to a second location onto a seating member so that the posterior of the person is directly in contact with said seating member.

4,085,472
INVALID BED ARRANGEMENT

Paul L. DiMatteo, Huntington, N.Y., assignor to Dynell Electronics Corporation, Melville, N.Y.

Division of Ser. No. 628,131, Nov. 3, 1975, Pat. No. 4,023,218, which is a continuation-in-part of Ser. No. 544,710, Jan. 28, 1975, Pat. No. 4,016,005. This application Nov. 22, 1976, Ser. No. 744,122
Int. Cl.² A61G *7/08, 7/02*
U.S. Cl. 5—90 **8 Claims**

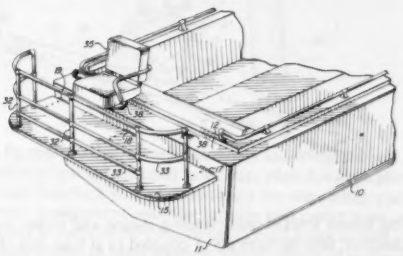


1. A method for transferring a person from a reclined position to a upright seated position comprising the steps of: supporting the backside of the person with posterior at a first location; moving the thighs of the person in a direction towards the front side of the other part of the person's body; bending said person's knees; placing a seating member in contact with the posterior of said person; moving said person together with said seating member to an upright seated position with the lower part of the legs directed downward; subdividing a bed member into first, second and third sections; reclining said person on said bed member; turning said first bed member section for carrying out said step of moving the thighs of the person in a direction towards the front side of the other part of the person's body; removing said first bed member section from contact with the posterior of said person prior to said step of placing a seating member in contact with the posterior of said person; and turning at least third bed member section for carrying out said step of moving said person together with said seating member to an upright seated position.

4,085,473
DECK PLATFORM EXTENSION FOR BOATS

Dwaine R. Franklin, 1845 Arizona Ave., Yuma, Ariz. 85364

Filed Sep. 2, 1976, Ser. No. 719,927
Int. Cl.² B63B *29/00*
U.S. Cl. 9—1.7 **8 Claims**



1. An improvement for attachment to the transom on the stern of the hull of a boat having a recessed cockpit and a gunwale surrounding the recessed cockpit adjacent the transom including, in combination:

a deck platform member having a length substantially equal to the width of the stern of the boat for mounting across the stern of the boat;

support means attached to said deck platform member for supporting said platform against the transom of the boat;

first fastening means for attachment to the upper portion of the transom of the boat; second fastening means attached to said deck platform member;

means for removably interconnecting said first and second fastening means together to permit said deck platform member to be removably attached to the transom of the boat;

railing means attached to the upper side of said deck platform member and extending around at least a part of the periphery of said platform member; and at least one chair mounted on the upper edge of the hull at the stern of the boat and facing rearwardly, and said platform member is spaced downwardly from the upper edge of the hull at the stern of the boat a sufficient distance to provide a natural footrest outboard of the hull of said boat for a person sitting in said chair over the gunwale portion of said boat substantially outboard of the cockpit area thereof.

4,085,474
APPARATUS FOR INTERIORLY CLEANING LENGTHS OF PIPE

Herbert R. Murphy, 3067 E. 1st St., Long Beach, Calif. 90803

Filed Aug. 23, 1976, Ser. No. 716,885
Int. Cl.² B08B *9/02*
U.S. Cl. 15—104.1 R **7 Claims**

1. Apparatus for interiorly cleaning lengths of pipe, said apparatus comprising;

an elongated primary carrier;

locating means on said primary carrier defining a cleaning station for receiving and orienting a length of pipe for cleaning;

clamping means for securing said length of pipe in said cleaning station;

an elongated secondary carrier located adjacent and in general longitudinal alignment with said primary carrier;

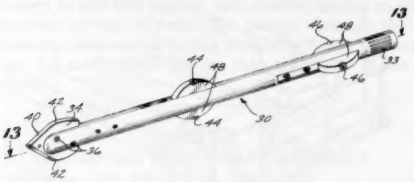
an elongated drive shaft;

a plurality of coupled bearing means longitudinally movable on and carried by said secondary carrier, and spaced along the length of and rotatably supporting said drive shaft adjacent said cleaning station;

a cutting tool mounted to said drive shaft;

drive means for rotating said shaft for rotating said cutting tool;

a carriage on said secondary carrier supporting said drive means and longitudinally movable on said secondary carrier in one direction for moving said cutting tool inwardly of and along the length of said length of pipe for effecting longitudinal movement of said plurality of bearing means toward said cleaning station and closer to one another, said carriage being coupled to at least one of said plurality of bearing means and longitudinally movable in a direction opposite said one direction for moving said cutting tool outwardly of said length of pipe and for effecting longitudinal movement of said plurality of bearing means away from said cleaning station and farther from one another;



means on said primary carrier for receiving said secondary carrier in a retracted position with respect to said primary carrier;

means for moving said secondary carrier between said retracted position and an extended position; and

means for locking said secondary carrier in said extended position.

4,085,475

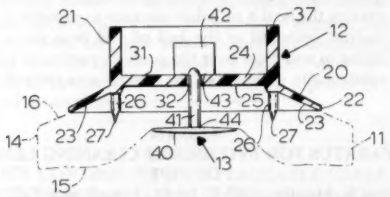
SCOURING DEVICE

Louis J. Silver, 3434 Baker St., San Francisco, Calif. 94123

Continuation-in-part of Ser. No. 638,348, Dec. 8, 1975, abandoned. This application Oct. 7, 1976, Ser. No. 730,372

Int. Cl.[2] A47L *17/08*

U.S. Cl. 15—209 D **14 Claims**



9. A scouring pad holder, comprising a single unitary rigid member having a rigid handle portion comprising a vertical wall surrounding a central cavity having a flat bottom wall with a central slit opening therethrough, and

a downwardly and outwardly sloping, frustoconical, rigid skirt portion surrounding the lower end of said vertical wall and having downwardly and outwardly sloping upper and lower surfaces, said holder having an upwardly recessed lower surface below said flat bottom wall and having downwardly extending projections.

4,085,476

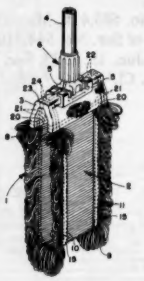
MOP CONSTRUCTIONS AND METHOD OF MAKING SAME

Theron V. Moss, Cleveland, Tenn., assignor to South Eastern Cordage Company, Cleveland, Tenn.

Filed Aug. 5, 1975, Ser. No. 602,149

Int. Cl.[2] A47L *13/12, 13/20*

U.S. Cl. 15—229 A **31 Claims**



1. A mop construction comprising a mop head consisting of a length of cord material, said cord material comprising one or more cords of yarn extending in a substantially continuous manner back and forth to provide plural mop cords extending generally transversely from one side of said mop head to the other to form loops of cord material along the opposite side edges of said mop head over a predetermined length, plural rows of stitching extending lengthwise of said mop head toward the ends of the length thereof parallel to the side edges thereof for securing said mop cords together, means for securing the ends of said mop head together to form a closed loop completely open in the center with said loops of cord material along the opposite side edges thereof, and means attached to said cord material at one point along the circumference of said closed loop extending transversely thereof providing for attachment of said cord material to a handle.

22. A mop construction comprising a mop head consisting of a length of cord material, and means connected to said cord material providing for attachment of said cord material to a handle, said cord material comprising one or more cords of yarn extending in a substantially continuous manner back and forth to provide plural mop cords extending generally transversely from one side of said mop head to the other to form loops of cord material along the opposite side edges of said mop head over a predetermined length, plural rows of stitching extending lengthwise of said mop head toward the ends of the length thereof parallel to the side edges thereof for securing said mop cords together, and means for securing the ends of said mop head together to form a closed loop with said loops of cord material along the opposite side edges thereof, said cord material having a fabric backing, the ends of said cord material being connected together to form a closed loop with said fabric backing on the inside of said closed loop, said ends of said mop head being turned back and secured together to expose the ends of said fabric backing which form a headband for said mop head.

4,085,477

FLUE AND CHIMNEY CLEANERS

Charles H. Anderson, P.O. Box 54, Accord, N.Y. 12404

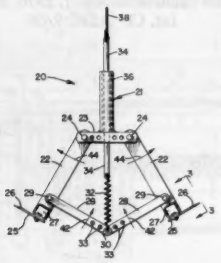
Filed May 13, 1977, Ser. No. 796,606

Int. Cl.[2] F23J *3/00*

U.S. Cl. 15—243 **6 Claims**

1. A tool for cleaning chimneys, flues, and the like comprising: a support opposed depending arms pivotally fixed at their upper ends to opposite ends of said support; scrapers having outwardly facing scraping edges fixed to the lower ends of said arms; inwardly extending levers pivotally secured at their outer ends to the lower ends of said depending arms; an actua-

tor rectilinearly displaceable relative to said support; and a spring fixed at one end to said actuator; the other end of said spring pivotally connecting together the inner ends of said levers, whereby rectilinear displacement of said actuator relative to said support will effect pivotal movement of said arms relative to said support with said spring providing a resilient connection therebetween to aid in the prevention of binding between the scrapers and a structure being cleaned.



4,085,478

SQUEEGEE APPARATUS

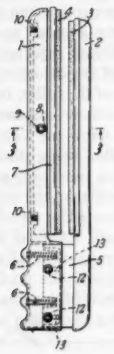
Thomas Alan Bailes, and Eric Taylor, both of 2-6 Boswell Court, London WC1N 3PS, England

Filed Oct. 7, 1976, Ser. No. 730,438

Claims priority, application United Kingdom, Oct. 17, 1975, 42795/75

Int. Cl.[2] B60S *1/04*

U.S. Cl. 15—245 **10 Claims**



1. Hand-held squeegee apparatus comprising:

first and second parallel arms adapted to be moved toward and away from one another while always remaining parallel;

first and second squeegee blades, one blade mounted on a first portion of each of said arms, at least one of said blades being resiliently mounted on its portion, said blades being positioned on their respective portions so as to face one another;

means for coupling corresponding second portions of said arms to one another so as to always maintain said two second portions parallel to one another; and

compression means positioned between said two second portions for urging said arms away from one another;

said second portions being adapted to be squeezed together by hand for urging said first and second arms toward one another.

4,085,479

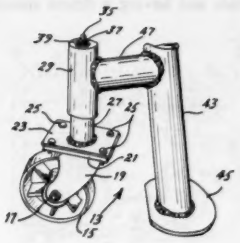
TOOL FOR REMOVAL AND REPLACEMENT OF CASTER SPRINGS

Rodney L. Barney, 2776 Crest Rd., Atwater, Calif. 95301

Filed May 31, 1977, Ser. No. 801,679

Int. Cl.[2] B60B *33/00*

U.S. Cl. 16—45 **1 Claim**



1. In combination, a caster assembly including a wheel journalled to a bracket attached to a caster plate having a plurality of holes therein, a jack plate having a corresponding plurality of holes in alignment with the holes in said caster plate, a bolt received in each of two opposing aligned holes in said caster and jack plates, an inner cylinder fixedly attached to the upper surface of said jack plate and extending upwardly therefrom, an outer cylinder slidably positioned over said inner cylinder, said outer cylinder being closed at the upper end and having a central aperture through the upper surface thereof, an elongated rod fixedly attached to the upper surface of said jack plate and extending axially upward through the center of said inner and outer cylinders, the upper end of said rod being threaded and extending through the aperture in said outer cylinder, an helical compression spring positioned inside said inner and outer cylinders around said rod urging said outer cylinder upward, a nut engaging the threads on said rod for maintaining said outer cylinder in a downward position, and a tool for removing and replacing said helical compression spring comprising a rectangular plate having a central opening therein for clearing the nut on said elongated rod, the bottom surface of said rectangular plate in contact with the top surface of said outer cylinder, two holes in said rectangular plate in alignment with two other opposing aligned holes in said caster and jack plates, two elongated threaded studs extending through the other aligned holes in said rectangular plate and said caster and jack plates, a nut threaded on each end of each stud to maintain said inner and outer cylinders in a fixed relative position while the nut on the elongated rod is removed, the nuts on said studs being loosended to allow said outer cylinder to move upward and relieve the pressure on said helical compression spring thereby permitting the spring to be removed and the caster assembly to be disassembled.

4,085,480

DECORATIVE DRAPERY ROD ASSEMBLY

David C. Kromm, Finksburg, and Henry Znamirowski, Ellicott City, both of Md., assignors to Roper Corporation, Kankakee, Ill.

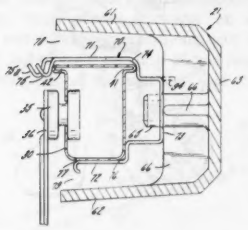
Filed Jan. 14, 1977, Ser. No. 759,264

Int. Cl.[2] A47H *1/04, 15/00*

U.S. Cl. 16—94 D **11 Claims**

1. A decorative drapery rod assembly comprising, in combination, a hollow rod of rectangular shape formed of partially telescoped inner and outer sections having laterally projecting beads extending along the top corners and a runner slot extending along the back surface, spaced wall brackets having stirrups projecting over the top surface of the rod for lockingly engaging the beads thereby to support the rod in horizontal working position, a series of decorative modules of channel shape fitted end to end in a repetitive pattern to provide an

illusion of solid continuity and having top, bottom and front walls for nestingly enclosing the rod, each module having a pair of C-shaped spring clips spaced therein, the spring clips being seated inside the front wall and having upper and lower arms spaced inwardly from the top and bottom walls respectively, the spring clips being dimensioned to accommodate both the inner and outer sections of the rod, the upper arm of each spring clip having an associated shoulder for engaging one of the beads and having a detent spaced therefrom for



engaging the other bead, the lower arm underlying the rod and serving to press the rod relatively upwardly into engagement with the shoulder and detent so that each module may be horizontally snapped into a captive forwardly-facing position on the rod after the rod has been installed in its horizontal working position on the wall, the detent presenting a surface enabling easy snapping on and off the rod, the modules being individually slideable endwise on the rod for centering of the series of modules with respect to the rod.

4,085,481

HAMMER-SET HOUSING FOR FURNITURE HINGES

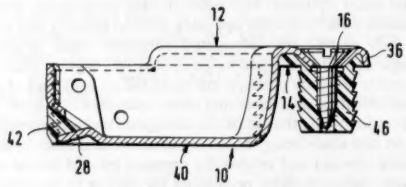
Karl Lautenschläger, Reinheim, Odenwald, Germany, assignor to Karl Lautenschläger, KG, Reinheim, Odenwald, Germany

Filed Feb. 9, 1977, Ser. No. 767,071

Claims priority, application Germany, Feb. 17, 1976, 2606181; Aug. 14, 1976, 2636767

Int. Cl.² E05D *5/02*

U.S. Cl. 16—159 **19 Claims**



1. Hammer-set housing for furniture hinges, having a hammer-set cup which can be pressed into a bore of suitable undersize in a furniture part, and which has at its outer margin a projecting lip which rests in a specified installed position on the flat outside of the furniture part and is adapted to be fastened to the part by additional mounting means, said hammer-set housing having first means visible in the installed state and consisting essentially of metal, and also having second means including two lateral plastic arms to be placed in the area within the bore in the furniture part, said second means also including a flat lip uniting said lateral plastic arms so as to form an integrally coherent plastic part, said first means having a dish-shaped metal part open at the top and inserted between the plastic arms, and also having a flange covering the plastic lip and projecting integrally from the upper margin of said metal part, said plastic part and said metal part being joined together releasably.

4,085,482

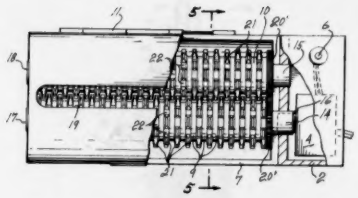
MEAT TENDERING MACHINE

Gérard Charron, 232 Lachapelle Street, Sherbrooke, Canada (J1G 3J2)

Continuation-in-part of Ser. No. 583,627, Jun. 4, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 720,565

Int. Cl.² A22C *9/00*

U.S. Cl. 17—26 **2 Claims**



1. A meat tenderizing machine comprising a pair of cylindrical rollers extending alongside each other, drive means connected to the rollers and counterrotating the latter at the same speed, each roller having similar meat tenderizing teeth projecting outwardly at the periphery thereof and disposed in annular rows with the teeth equally separated by intervening free spaces within said annular rows and with the bottom of said free spaces substantially coinciding with the outer cylindrical surface of the roller, the annular rows of teeth being spaced axially of the roller to define free annular zones between the annular rows of each pair of annular rows, the teeth of each second annular row of any one roller being in substantial register axially of the roller, the teeth of any one annular row of any one roller being in substantial register with the intervening free spaces of adjacent annular rows axially of the roller, the teeth of one roller engaging the annular zones of the other roller and the teeth of the other roller engaging the annular zones of the one roller, the teeth of any one roller, being, axially of the roller, in register with, close to but out of contact with, a tooth of the other roller on one side of said teeth and being, axially of the roller, in register with one intervening free space and with one annular zone of the other roller, on the other side of said teeth, the width of the teeth of any one roller, axially of the roller, being smaller than the sum of the widths of said intervening free space and of the adjacent annular zone and being greater than the space separating said teeth from the teeth of the other roller on said one side, this registering intervening space and adjacent annular zone defining a meat holding cavity wherein meat is free of compression by the teeth to enable flowing into the portion of the meat in said cavity of the internal blood of the meat compressed out by the action of the teeth on the remaining zones of the meat.

4,085,483

APPARATUS FOR SHIRRING TUBULAR FILMS

Bruno Winkler, Weinheim-Oberflockenbach, Germany, assignor to Naturin-Werk Becker & Co., Weinheim, Germany

Filed Jan. 22, 1975, Ser. No. 543,073

Claims priority, application Germany, Jan. 25, 1974, 2403470

Int. Cl.² A22C *13/02*

U.S. Cl. 17—42 **15 Claims**

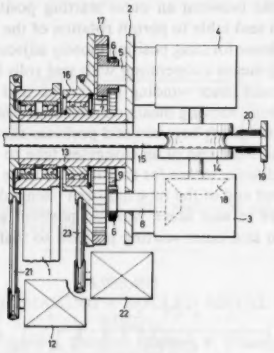
1. Apparatus for shirring a tubular film, comprising:

a shirring mandrel having an axis;

a plurality of shirring rollers, disposed about said mandrel, each of said rollers being rotatable on a roller axis perpendicular to said mandrel axis and having a plurality of substantially identical teeth, said rollers being arranged to continuously rotate in a selected direction about said mandrel axis;

and means for rotating said rollers on said roller axes to cause said teeth to apply shirring forces, parallel to said

mandrel axis, to a tubular film on said mandrel and for continuously rotating said rollers about mandrel axis to



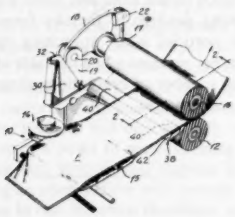
cause the points at which said shirring forces are applied to continuously rotate about said mandrel axis.

4,085,484

APPARATUS FOR TREATING TUBULAR FABRICS

Edward I. Aronoff, St. Laurent; William J. McLay, and Robert E. Mitchell, both of Montreal, all of Canada, assignors to Knit-Fin Machinery Ltd., Montreal, Canada

Filed Dec. 15, 1975, Ser. No. 640,854
Int. Cl.[2] D06C 5/00
U.S. Cl. 26—84 **3 Claims**



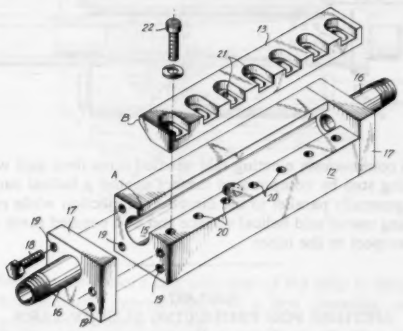
1. An apparatus for treating tubular fabrics comprising a frame on which at least a pair of pressure squeeze rollers are provided forming a nip, a plane defined at the nip coincidental with the path of the tubular fabric passing therethrough, spreader means provided in the path upstream of the nip and subtended between drive rollers, a blade extending laterally of the path of the fabric in contact with the tubular fabric, but below it, upstream of the squeeze rollers and downstream of the spreader, at least one of the squeeze rollers being journaled at each end to one of a pair of levers pivoted to the frame, means adapted to move the levers so as to move the one squeeze roller from the other, actuating means connected to the blade and to the means for moving the levers such that if an obstacle hits the blade during the operation, the actuating means will activate the moving means to open the gap between the squeeze rollers.

4,085,485

PROCESS AND DEVICE FOR FORMING NON-WOVEN FABRICS

Ralph E. Brandon, Monroe; Michael Ring, Warwick, and Raymond Redner, III., Newburgh, all of N.Y., assignors to International Paper Company, New York, N.Y.

Filed Jul. 26, 1976, Ser. No. 708,537
Int. Cl.[2] D04H 1/46
U.S. Cl. 28—104 **27 Claims**



1. A device for applying a liquid against a batt of fibers to entangle the fibers, comprising:

a first member, having a recessed portion defining at least a major portion of a longitudinal chamber, adapted to contain a liquid delivered therein from a liquid supply source under a pressure sufficient to effect fiber entanglement upon application of the liquid from the device against the fiber batt, and having an integral first machined surface extending substantially the length of said chamber;

a second member, having a second machined surface extending substantially along its entire length and conforming to an open portion of said first member, to form with said first member said longitudinal chamber and a slot providing communication from said chamber to the exterior of the device; and

means for securing together said first and second members, so that said first and second machined surfaces define said slot;

said first and second machined surfaces being essentially parallel and rigid, whereby a substantially non-diverging curtain of liquid can be delivered through said slot for application against the batt of fibers; and

at least one of said first and second machined surfaces being serrated, the serrations being uniform along the length of said surfaces, so that the curtain delivered through said slot in the area of two similar serrations is substantially uniform and similar in width.

4,085,486

METHOD OF PRODUCING NEEDLED, NON-WOVEN TUBING

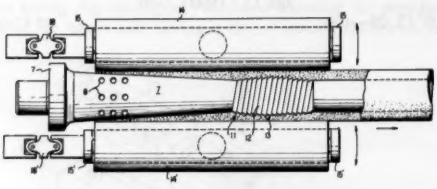
Richard Dilo, Eberbach-N, Germany, assignor to Rontex America, Inc., Chelmsford, Mass.

Continuation-in-part of Ser. No. 386,552, Aug. 8, 1973, Pat. No. 3,952,121, which is a division of Ser. No. 116,030, Feb. 17, 1971, Pat. No. 3,758,926, which is a continuation-in-part of Ser. No. 882,391, Dec. 1, 1969, abandoned, which is a division of Ser. No. 741,492, Jul. 1, 1968, Pat. No. 3,530,557. This application Apr. 19, 1976, Ser. No. 681,089
Claims priority, application Germany, Nov. 21, 1975, 2552243
Int. Cl.[2] D04H 1/46
U.S. Cl. 28—110 **4 Claims**

1. The method of making non-woven tubing comprising:

(a) winding at least one non-woven web of fibers at an angle forming a helix of at least partially overlapping turns,

(b) needling a multiplicity of fibers from each turn transversely through at least one subjacent turn to fasten said turns to each other,
(c) permitting said needled turns to shrink substantially radially,
(d) radially compressing said needled turns, and



(e) continuously ejecting said needled turns from said winding step by compression thereof against a helical surface generally parallel to the direction of ejection while rotating one of said helical surface and said needled turns with respect to the other.

4,085,487

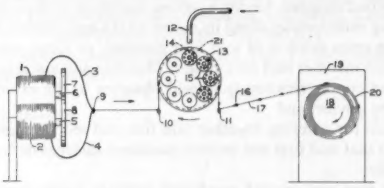
METHOD FOR PRODUCING SLUBBY YARN

Herbert W. Barch, Natrona Heights, and August G. Bohy, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 749,198, Dec. 9, 1976, which is a continuation-in-part of Ser. No. 639,723, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 582,493, May 30, 1975, abandoned. This application May 26, 1977, Ser. No. 800,990

Int. Cl.[2] D02G *1/16, 3/24;* D02J *1/06*

U.S. Cl. 28—252 **17 Claims**



1. A method of providing a slubby strand of fibers comprising passing a consolidated strand containing a multiplicity of fibers over a surface, providing on said surface a multiplicity of fluid passages over which said strand is passed, introducing onto the surface of the strand a fluid at high pressure continuously, passing said fluid through said strand and exhausting a portion of said fluid through said fluid passages and below the surface of the strand to thereby form a plurality of slubs in said strand with said fluid and collecting from said surface a strand having slub thereon.

4,085,488

METHOD AND APPARATUS FOR WINDING AND FORMING COOLING COILS

Eckehard Hanert, Sennestadt, and Anton Ehlen, Warburg, both of Germany, assignors to Benteler-Werke Aktiengesellschaft Werk Neuhaus, Schloss Neuhaus, Germany

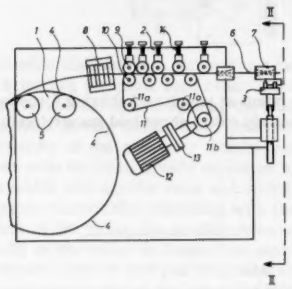
Filed Oct. 15, 1976, Ser. No. 733,020

Claims priority, application Germany, Oct. 18, 1975, 2546766

Int. Cl.[2] B21D *53/06*

U.S. Cl. 29—33 G **15 Claims**

1. Apparatus for winding cooling coils of substantially rectangular form with outwardly bulging stamped corner portions, comprising a winding table of rectangular configuration rotatable from a starting position about a central axis; at least four rolls respectivly mounted in the region of the corners of the rectangular table, each movable in radial direction between an inner winding position and an outer forming position; at least four punch means arranged for cooperation with said rolls and each movable between an outer starting position outwardly spaced from said table to permit rotation of the latter about its axis and an inner forming position closely adjacent to said rolls; first moving means cooperating with said rolls for moving the same from said inner winding position to said outer forming position; second moving means connected to said punch means for moving the latter between said positions thereof; means for clamping the front end of an elongated tube to be wound into a coil to said table; means for rotating said table about said axis after the front end of the tube has been clamped thereon while said rolls are in said inner winding position and said punch means are in said outer starting position so that a tube will be



wound in a coil about the rolls at the corners of said table; means upstream of said table for maintaining the tube during winding thereof in taught condition; tube guide means between said upstream means and said table and movable in a direction of said axis and in a direction transverse thereto; means cooperating with said tube guide means for moving the latter in the direction of said axis during rotation of said table about said axis; and control means for actuating said first moving means to move said rolls from said inner winding position to said outer forming position and said second moving means to move said punch means from said outer starting position to said inner forming position to thereby form said outwardly bulging corner portions while stretching the tube portions between said corner portions when the table after having made a predetermined number of revolutions about its axis has returned to said rest position.

4,085,489

PROCESS FOR FABRICATING HOLLOW RACES OR WHEELS PROVIDED AT THEIR LATERAL ENDS WITH AXLE STUMPS IN WHICH PROCESS SUBSTANTIALLY NO CHIPS ARE PRODUCED; AND RACES AND WHEELS MANUFACTURED IN ACCORDANCE WITH THIS PROCESS

Dietfried Tresser, Gusterath, Germany, assignor to Laeis-Werke AG., Trier, Germany

Filed Apr. 11, 1977, Ser. No. 786,279

Claims priority, application Germany, Apr. 10, 1976, 2615738

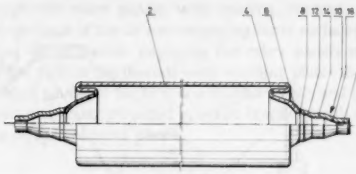
Int. Cl.[2] B21B *27/02*

U.S. Cl. 29—110 **8 Claims**

1. An improved process for producing a roller and the like, having axle stumps at both of their ends, from hollow cylindrical pipes, the improvement comprising the steps of

conically reduced and shaping opposite end portions of a

pipe, having an exterior diameter corresponding to that of the roller, by means of a pipe shaping machine; and



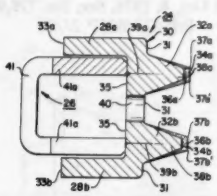
thereafter bending inwardly into said pipe said conically shaped end portions.

4,085,490

METHOD OF MAKING A ROLLED METAL PISTON RING

Harold E. McCormick, Ballwin; Herbert F. Prasse, Town and Country; William F. Ott, and Donald J. Mayhew, both of St. Louis, all of Mo., assignors to Ramsey Corporation, St. Louis, Mo.

Filed Apr. 1, 1976, Ser. No. 672,751
Int. Cl.[2] B23P *15/06*; B21D *53/84*
U.S. Cl. 29—156.6 **17 Claims**



1. In a method of forming a piston ring for location in a circumferential groove in a piston movable in a cylinder bore of an internal combustion engine, which piston ring comprises a steel strip of split ring shape and has an intermediate wall portion and a pair of sidewalls extending radially inwardly therefrom and has at its outer periphery a pair of axially spaced cylindrical surfaces for oil scraping engagement with the cylinder bore and which are each located respectively at the outer end of a solid rigid rim which extends radially outwardly with respect to the intermediate wall portion, the steps of providing a strip of steel of uniform width and thickness and which strip has opposite major surfaces and opposite edges, moving said strip linearly through a series of metal forming stations, progressively forming said strip in said stations into a channel-form shape having an intermediate wall portion with sidewall portions extending in one direction therefrom and with a pair of parallel solid rigid rim portions extending in the opposite direction therefrom, each of said solid rigid rims being provided with a flat outer surface at said outer end, coiling the formed steel strip into a helical coil with the sidewall portions extending radially inwardly and the solid rigid rims extending radially outwardly, and slitting said helical coil lengthwise to form individual piston rings.

4,085,491

SOLAR ENERGY HEAT EXCHANGER AND METHOD FOR MAKING SAME

Richard G. Mathwig, 2218 E. Evergreen, Mesa, Ariz. 85203

Filed Mar. 1, 1976, Ser. No. 662,362
Int. Cl.[2] B23P *15/26*
U.S. Cl. 29—157.3 AH **1 Claim**

1. A method for manufacturing a heat exchanger from a fluted strip and a pipe, said method comprising the steps of:

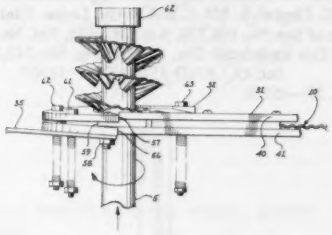
a. introducing the fluted strip through a feed chute;

b. supporting the pipe within an aperture;

c. guiding the strip from the feed chute through a spiral trough within the aperture and disposed about the supported pipe;

d. securing the beginning of the strip to the pipe with at least one stanchion;

e. simultaneously rotating and translating the pipe to draw the strip through the feed chute and trough and spirally wind the strip about the pipe;



f. forming the flutes along one edge of the strip to define a line generally representative of a first sinusoidal curve superimposed upon a helix;

g. forming simultaneous with step (f) the sinusoidal flutes along another edge of the strip to define a line generally representative of a second sinusoidal curve superimposed upon a helix;

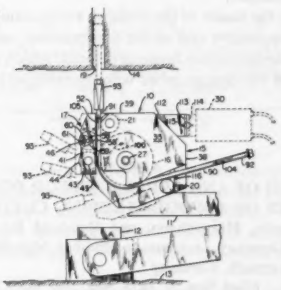
h. attaching the terminal end of the strip to the pipe with at least one stanchion.

4,085,492

BENDING AND STRAIGHTENING MECHANISM FOR MINE ROOF BOLTS

Ronald R. Stange, Denver, Colo., assignor to Tools for Bending, Inc., Denver, Colo.

Division of Ser. No. 565,421, Apr. 7, 1975, Pat. No. 4,003,233.
This application Nov. 15, 1976, Ser. No. 741,731
Int. Cl.[2] E21D *21/00*
U.S. Cl. 29—431 **4 Claims**



1. The method of inserting mine roof bolts into holes in the roof of a mine tunnel, comprising the steps of:

moving a portable bolt bending apparatus into alignment with a hole in the roof;

placing a shank of limited length having an expandible head so that its leading end is at right angles to the hole and intially bending the leading end of said shank at a location a spaced distance rearward of said expandible head around a curved guide path on said apparatus to place an initial bend in said shank until said leading end is in axial alignment with said hole;

advancing said shank along the guide path to successively bend said shank into axial alignment with said hole at

progressively rearward locations along its length away from said leading end while simultaneously applying straightening forces on the bent portions of said shank as said bent portions advance into axial alignment with said hole.

4,085,493

METHOD OF PRODUCING EGG COOKING INDICATOR

Duane G. Chadwick, 555 E. 3rd North, Logan, Utah 84321

Division of Ser. No. 608,570, Aug. 28, 1975, Pat. No. 3,998,099.
This application Dec. 3, 1976, Ser. No. 747,359
Int. Cl.[2] B21D *39/00*; B23P *19/04*
U.S. Cl. 29—455 R **2 Claims**

1. A method of producing an egg cooking indicator comprising attaching a thermometer to a backing member;

insulating around a temperature responsive end of the thermometer and affixing the thermometer to the backing member in a calibrated position;

suspending the backing member and thermometer in a tubular transparent housing such that an air space substantially surrounds the insulated temperature responsive end of the thermometer;

silvering the inside of the housing surrounding the temperature responsive end of the thermometer; and

sealing the end of the housing through which the thermometer and backing member were inserted to be suspended.

4,085,494

METHOD OF AND APPARATUS FOR POSITIONING BLADES OF A WOOD-CHIPPING CUTTER DRUM

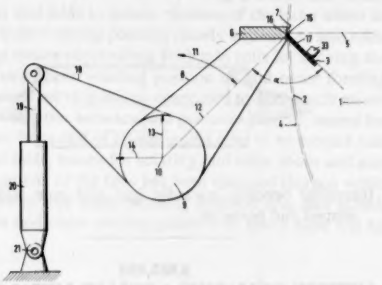
Hans Sybertz, Hargesheim, and Reinhold Riedl, Gensingen, both of Germany, assignors to Hombak Maschinenfabrik KG, Bad Kreuznach, Germany

Filed Nov. 8, 1976, Ser. No. 740,231
Claims priority, application Germany, Nov. 8, 1975, 2550318; May 11, 1976, 7614862
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 29—468 **9 Claims**

1. In combination with a drum elongated in the direction of and rotatable about a drum axis and carrying at least one axially elongated blade having a cutting edge defining an orbit on rotation of said drum and radially displaceable in a blade direction crossing said orbit relative to said drum axis, an adjustment device for aligning said cutting edge on an ideal desired orbit centered on said drum axis, said device comprising:

an elongated alignment bar having a flat surface and pivotal about a bar axis fixed relative to said drum axis and substantially parallel to said surface; and

means for pivoting said bar about said bar axis for pressing said surface against said cutting edge and displacing the same toward said drum axis in said blade direction until said cutting edge lies on said ideal desired orbit.

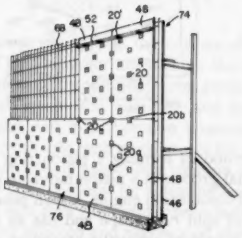


4,085,495

METHOD OF ERECTING FORMS FOR A CONCRETE FORM

Napoleon R. Hebert, 2301 I St., NE., Auburn, Wash. 98002

Filed Oct. 4, 1976, Ser. No. 729,023
Int. Cl.[2] B23P *21/00*
U.S. Cl. 29—469 **12 Claims**



1. A method of erecting a form for a concrete wall, said method comprising:

a. providing a first panel having through holes therein at spaced locations over a substantial portion of the panel, some of which holes are edge holes located proximate edge portions of said panel at a predetermined edge distance therefrom,

b. inserting tie rods through said panel holes, each of said tie rods having a spacing element which engages an inner surface of said panel, placing wedging plates against an outer surface of said panel and engaging the rods with the wedging plates in secure wedging relationship in slotted openings in the wedging plates, so that spacing elements of the tie rods firmly engage the inner surface of the panel,

c. placing the panel in a vertically erect position and bracing the panel in that position,

d. providing a second panel, inserting tie rods therein, each of said tie rods having a spacing element which engages an inner surface of said second panel, and placing wedging plates against the second panel in wedging engagement with the tie rods, so that the spacing elements of the tie rods firmly engage the inner surface of the second panel,

e. placing the second panel in a vertically erect position adjacent the first panel,

f. at least one lateral dimension of at least one of the wedging plates, measured from the slotted opening of the plate to the edge of the plate being greater than the edge distance of its related panel to thus provide an overlapping portion of the wedging plates to engage the adjacent panel, and

g. completing the form by placing a second set of panels opposite the first two panels in spaced relationship therefrom, so that the opposite ends of the tie rods extend through the other panels, with spacing elements on the opposite ends of the tie rods engaging inner surfaces of the second set of panels, engaging the other panels and the opposite ends of the tie rods with wedging plates to secure the other panels to the first and second panels and placing at least one waler mounted in waler brackets with at least some of the wedging plates.

4,085,496

MANUFACTURE OF METALLIC STRIP

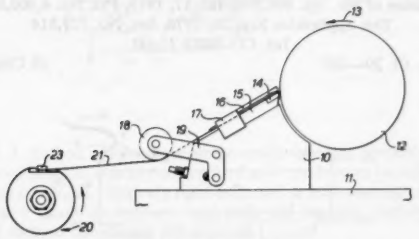
Dalip T. Malkani, and Andrew Middlemiss, both of Sheffield, England, assignors to British Steel Corporation, London, England

Filed Dec. 28, 1976, Ser. No. 755,060

Claims priority, application United Kingdom, Jan. 14, 1976, 1393/76

Int. Cl.² B22D *11/126*

U.S. Cl. 29—527.2 **8 Claims**



1. A method of manufacturing metallic strip which differs in composition across its width which method includes the steps of rotating about its longitudinal axis, a cylindrical workpiece comprising a plurality of co-axial cylindrical components of equal diameter, adjacent components being comprised of material of differing composition, feeding a cutting tool continuously into the peripheral surface of the workpiece as it rotates so as to produce a continuous strip peeled from the surface of the workpiece, and collecting the peeled strip by winding it under tension around a coiler.

4,085,497

TERMINATION APPARATUS FOR ELECTRICAL CONNECTORS

John Peter Nijman, West Hill, and Terence Neville Tompkins, Newmarket, both of Canada, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 27, 1976, Ser. No. 735,956

Int. Cl.² H01R *43/04*

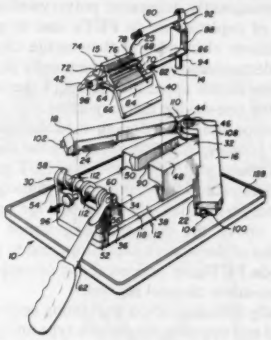
U.S. Cl. 29—566.3 **21 Claims**

1. An apparatus for terminating a plurality of insulated electrical conductors in respective insulation-piercing contact portions of an electrical connector, comprising:

a frame; means carried by the frame for supporting said connector and aligning said conductors adjacent respective insulation-piercing contact portions of said connector;

a pair of insertion arms rotatably mounted on said frame for movement toward respective sides of said connector, each of said arms carrying at least one insertion means for engaging and pressing respective insulated conductors into respective insulation-piercing contact portions of said connector; and

actuator means responsive to a common applied force for simultaneously applying sufficient operating force to each of said insertion arms and for causing said insertion arms to simultaneously cut and insert said conductors into



respective insulation-piercing contact portions of said connector.

4,085,498

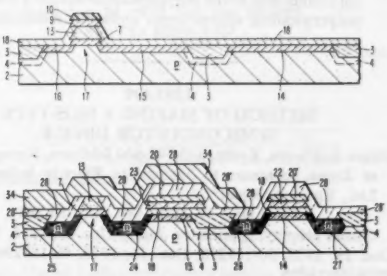
FABRICATION OF INTEGRATED CIRCUITS CONTAINING ENHANCEMENT-MODE FETS AND DEPLETION-MODE FETS WITH TWO LAYERS OF POLYCRYSTALLINE SILICON UTILIZING FIVE BASIC PATTERN DELINEATING STEPS

Vincent L. Rideout, Mohegan Lake, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 656,756, Feb. 9, 1976. This application Jul. 2, 1976, Ser. No. 702,247

Int. Cl.² H01L *21/28, 29/78;* B01J *17/00*

U.S. Cl. 29—571 **26 Claims**



1. A method for fabricating an array of one-device memory cells and enhancement-mode and depletion-mode FETs on the same semiconductive substrate which comprises:

(A) providing a semiconductive substrate of a first conductive type containing active impurities of a first conductive type;

(B) providing and delineating predetermined oxide isolation regions above or recessed into the substrate to provide insulating field oxide regions between said memory cell and said enhancement-mode and said depletion-mode FETs and other memory cells and FETs on the same semiconductive substrate;

(C) providing an enhancement mode FET gate insulator;

(D) depositing and doping a layer of polycrystalline silicon above said gate insulator;

(E) then delineating the predetermined polycrystalline silicon gate regions of the enhancement mode FET with an oxidation barrier layer;

(F) providing a capacitor insulator and depletion-mode FET gate insulator;

(G) thermally diffusing or ion implanting active impurities of

a second and opposite conductivity type into predetermined regions of the semiconductive substrate to provide depletion-mode channel regions above which regions are to be subsequently delineated polycrystalline silicon gate regions of depletion-mode FETs; and to provide lower doped silicon electrodes of the storage capacitors above which electrodes are to be subsequently delineated polycrystalline silicon upper electrodes of the storage capacitors of the one-device memory cells;

(H) then depositing and doping a second and subsequent layer of polycrystalline silicon above the capacitor insulator, and above said depletion-mode FET gate insulator;

(I) then delineating the second and subsequent layer of doped polycrystalline silicon to provide upper electrode regions above the corresponding doped lower silicon electrodes of the storage capacitors, and to provide depletion-mode FET gate regions above corresponding doped depletion-mode channel regions;

(J) thermally diffusing or ion implanting active impurities of a second and opposite conductive type into predetermined regions of the semiconductive substrate and at greater doping concentration than the doping concentration employed in step (G) and being sufficient to provide doped sources and drains of both the enhancement-mode FETs and the depletion-mode FETs;

(K) thermally growing a silicon dioxide insulating layer over regions of the structure but not over the polycrystalline silicon enhancement-mode FET gate which is still protected by an oxidation barrier layer;

(L) removing the oxidation barrier layer from over the enhancement-mode FET gate by use of an etchant;

(M) delineating contact holes to polycrystalline silicon upper capacitor electrodes; to doped sources and drains in circuits peripheral to the array of memory cells; and to polycrystalline silicon depletion-mode FET gates; and

(N) depositing and delineating a metallic-type high-conductivity electrical interconnection pattern that makes electrical connection to the polycrystalline silicon FET gates, to polycrystalline silicon upper capacitor electrodes, and to source and drain regions.

4,085,499

METHOD OF MAKING A MOS-TYPE SEMICONDUCTOR DEVICE

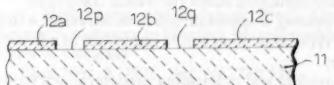
Shigeo Kuninobu, Kyoto, and Takeshi Ishihara, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 27, 1976, Ser. No. 754,261

Claims priority, application Japan, Dec. 29, 1975, 50-159294; Dec. 29, 1975, 50-159295; Dec. 29, 1975, 50-159296; Feb. 20, 1976, 51-18098

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **2 Claims**



1. A method of making an MOS-type semiconductor device, comprising the steps of:

forming a SiO_2 layer on a silicon substrate;

selectively etching the SiO_2 layer to form openings which are located in correspondence to regions where functional regions are to be formed in the silicon substrate;

coating the face of the thus formed structure with a polycrystalline silicon layer;

diffusing a first impurity into selected regions of the polycrystalline silicon layer;

forming a silicon nitride mask on selected surface areas of the polycrystalline silicon layer for preventing subsequent oxidation of the regions under said areas;

heating and oxidizing the region of the polycrystalline silicon layer other than that covered with the silicon nitride layer for diffusing the impurities into the silicon substrate from the polycrystalline silicon regions facing the substrate to form the functional regions and also diffusing said first impurity from the polycrystalline silicon region into the substrate through the SiO_2 layer for forming a shallowly diffused region having said impurity diffused thereinto to a depth less than the depth to which said substrate regions facing the polycrystalline silicon through said openings have had said impurity diffused thereinto;

removing the silicon nitride layer; and

providing conductors on the exposed silicon oxide.

4,085,500

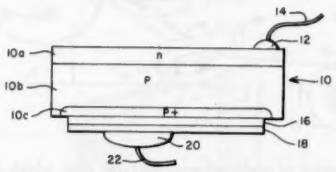
OHMIC CONTACTS TO P-TYPE MERCURY CADMIUM TELLURIDE

Robert J. Hager, Minneapolis; Eric S. Johnson, Minnetonka; M. Walter Scott, Minnetonka, and Ernest L. Stelzer, Minnetonka, all of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 596,890, Jul. 17, 1975, Pat. No. 4,000,508. This application Sep. 29, 1976, Ser. No. 727,814

Int. Cl.² B01J *17/00*

U.S. Cl. 29—589 **25 Claims**



1. A method of forming a contact to p-type mercury cadmium telluride, the method comprising:

depositing a Column IB metal on at least a portion of a surface of p-type mercury cadmium telluride;

depositing a buffer material on the Column IB metal; and

contacting the buffer material with a low melting temperature bonding material.

4,085,501

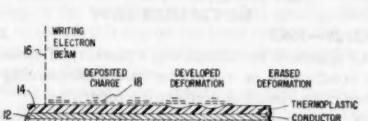
METHOD FOR FABRICATION OF INTEGRATED OPTICAL CIRCUITS

George Daniel Currie, Brighton, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Sep. 18, 1975, Ser. No. 614,523

Int. Cl.² H01S *4/00*

U.S. Cl. 29—593 **11 Claims**



1. The method of making an integrated optical circuit, which comprises the steps of:

(a) forming a layer of synthetic resinous material capable of supporting guided wave propagation of coherent light and having a selected index of refraction on a substrate which comprises a material having an index of refraction less than said selected index of refraction; and

(c) forming by selected local impingement of a scanning

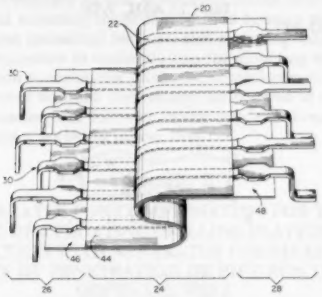
electron beam directly on said layer, series of optical components optically aligned in said layer and which optically affect guided wave propagation of coherent light supported by said layer.

4,085,502

JUMPER CABLE

Barry I. Ostman, Merrimack, and Joseph A. Roberts, Hudson, both of N.H., assignors to Advanced Circuit Technology, Inc., Merrimack, N.H.

Filed Apr. 12, 1977, Ser. No. 786,886
Int. Cl.[2] H02G *15/00*
U.S. Cl. 29—629 **14 Claims**



1. A method of forming a jumper cable having a plurality of spaced metallic conductors, each of said conductors including a pair of spaced, relatively rigid ends, and at least one region of relative flexibility between said ends and integral therewith, said method comprising the steps of:

(A) providing a flexible metallic sheet;

(B) forming mesas of thickness approximating that desired for said rigid ends on edge regions of said sheet;

(C) milling said sheet so as to define said conductors and integral ends; and

(D) covering said spaced conductors at least in part with a flexible insulating material while maintaining said conductors in spaced relation to one another.

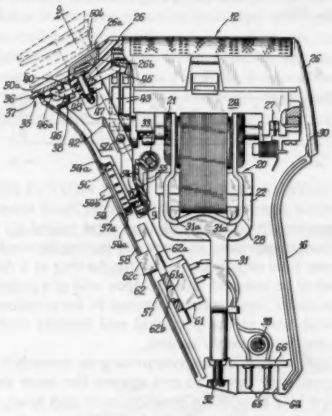
4,085,503

ELECTRIC DRY SHAVER WITH ADJUSTABLE LONG HAIR TRIMMER

William P. Beck, Westchester; Francis L. Carr, Downers Grove, and Jerry P. Gronwick, Park Ridge, all of Ill., assignors to Sunbeam Corporation, Chicago, Ill.

Filed Dec. 23, 1974, Ser. No. 535,949
Int. Cl.[2] B26B *19/10*
U.S. Cl. 30—34.1 **9 Claims**

2. A long hair clipper for trimming hair close to the skin and for trimming hair at selected lengths comprising a blade set including a comb fixed with respect to a housing and a cutter, said comb and cutter each having a row of teeth formed along one edge thereof, a motor drivingly connected to said cutter for reciprocating said cutter with said teeth on said cutter in shearing engagement with the teeth on said comb, said comb being a flat plate mounted on a recessed surface on said housing with said cutter positioned between said comb and the housing, a wedge-shaped guard member having a grooved outer face and a flat inner face adapted to lie flat against said comb, said guard member having a thin edge tapering to a thick edge, slots in said guard member extending from said thin edge toward said thick edge forming pointed teeth which extend substantially to the middle of said guard member, said housing defining a wedge-shaped recess within which said comb is mounted, said recess being shaped to receive said guard member in its lowermost position flat against said comb, the walls of said housing defining said recess being substantially flush with outer surface of said guard member in said lowermost position, and support means carried by said guard member extending into said housing to selectively position said guard member at any of a number of elevated positions spaced



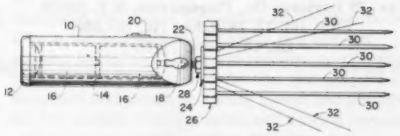
from said comb, said support means including support legs which extend normal to said comb through slots in said housing which slots guide said legs for lengthwise movement.

4,085,504

MULTI-BLADED KNIFE

Janos Nagy, 2600 Monroe St., Hollywood, Fla. 33020

Filed Jan. 24, 1977, Ser. No. 761,995
Int. Cl.[2] B26B *3/04*
U.S. Cl. 30—123 **9 Claims**



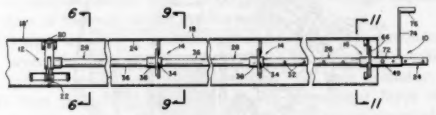
1. A multi-bladed knife comprising a handle, light producing means for emanating light beams in the direction of the object to be cut by said knife, fastening means for securing at least one blade to said handle, a plurality of blades, said blades extending parallel to each other in spaced apart relationship and having the longitudinal axes of said blades parallel to the longitudinal axis of said handle when said blades are secured to said handle utilizing said fastening means therefore, said fastening means including a bar threadingly secured to one end of said handle, the longitudinal axis of said bar transverse to said longitudinal axis of said handle, said bar having a cover plate for removable engagement to said bar, said cover plate extending substantially the length of said bar along said longitudinal axis thereof, said bar and said cover plate having co-terminus notches located in spaced apart relationship in the adjacent faces of said bar and said cover plate, said notches having blade securing means for engaging one end of each of said blades to said bar, said cover plate capturing said one end of said each of said blades and preventing the inadvertent disengagement of said end of said each of said blades from said bar, each of said notches having a first internal wall, said first wall parallel to said longitudinal axis of said handle.

4,085,505

POLYETHYLENE INTERNAL BEAD REMOVER

Arthur H. McElroy, 5619 E. Independence, Tulsa, Okla. 74115

Filed Nov. 15, 1976, Ser. No. 741,558
Int. Cl.[2] B26B *3/00*
U.S. Cl. 30—278 9 Claims



1. Apparatus for removing the internal bead from a joint between two lengths of polyethylene pipe joined by the butt fusion method, comprising an assembly having in combination;

(a) a torque tube of adjustable length, having at a distal end, adapted to be inserted into the open end of a polyethylene pipe, a cutter head means adapted to be positioned over said bead, and at the proximal end outside said pipe, a crank handle assembly means;

(b) said cutter head means comprising an assembly, including support leg means to rest against the inner surface of said pipe in a straddling position over said bead, a cutter arm means rotatably supported to said leg means about an axis which is offset from and parallel to the axis of said pipe, the length of said cutter arm means being such that the free end of said cutter arm means is spaced from the said inside surface of said pipe in a first position and in contact with said inside surface in a second position, a cutter blade positioned at said free end at a selected angle the outermost end of said blade positioned substantially parallel to said torque tube and approximately at the inner surface of said pipe, and means co-axially with said offset axis to attach said distal end of said torque tube to said cutter arm; and

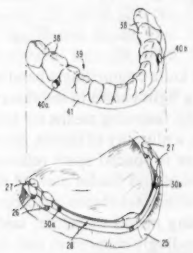
(c) means to rotatably support said torque tube within said pipe.

4,085,506

LOCKING DEVICE FOR DENTAL PROSTHESES

Isaih Lew, 29 Bayberry Dr., Pleasantville, N.Y. 10570

Filed Jul. 22, 1976, Ser. No. 707,604
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—2 7 Claims



1. A locking device (especially useful) for dental prostheses, which comprises:

(a) a hollow cylinder with openings at both ends, which is adapted to be affixed to or in a dental prosthesis, and

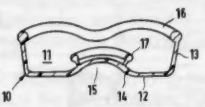
(b) a plunger slidably mounted in the cylinder so that the locking end of the plunger may be extended from one end of the cylinder or substantially retracted to that end of the cylinder as the plunger is slid into or away from the cylinder by the manipulation of the other end of the plunger; whereby when extended from the cylinder affixed to or in a dental prosthesis in the mouth, the end of the plunger engages an orifice in a fixture in the mouth and when retracted into the cylinder, the end of the plunger is withdrawn from the orifice in the fixture in the mouth, thereby respectively locking the the prosthesis to the fixture or unlocking it from the fixture.

4,085,507

APPLIANCE FOR TAKING DENTAL IMPRESSIONS AND METHOD AND APPARATUS FOR MAKING THE SAME

F. Heinrich Lehn, Unionstrasse 5, 4760 Werl, and Hans-Jürgen Schmitter, Sonnenwall 29, 4300 Duisburg, bothof, Germany

Filed Jul. 12, 1976, Ser. No. 704,546
Claims priority, application Germany, May 5, 1976, 2619799
Int. Cl.[2] A61C *9/00*
U.S. Cl. 32—17 2 Claims



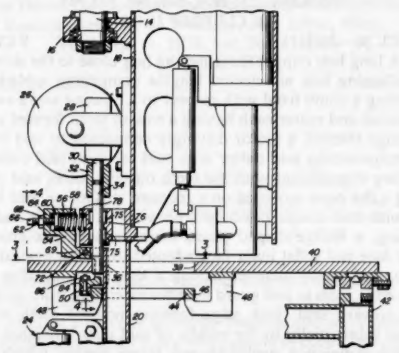
1. A dental impression appliance comprising: a one-piece molded part of synthetic material with a form-stable reception channel for impression material, said reception channel being horseshoe-shaped to correspond to a human jaw, a handgrip extending from the closed side of the horseshoe outward, a base plate with a plane in which the handgrip extends, said reception channel being bounded on one side by said plane, said reception channel being bounded along its inside and outside edges by sections raised towards the same side from the plane of said base plate, said sections having retention edges on the inside of said channel forming undercuts running at a distance from the base plate in the area of the open side of the channel.

4,085,508

TWIN TEMPLATE CAM TRACKER

Josef Gyongyosi, P.O. Box 314, Southfield, Mich. 48075

Filed Dec. 21, 1976, Ser. No. 752,832
Int. Cl.[2] B26D *5/30*
U.S. Cl. 33—27 K 4 Claims



1. A cam tracker comprising a master cam having a master cam surface thereon, means supporting said master cam, a master cam follower, a drive shaft supporting said cam fol-

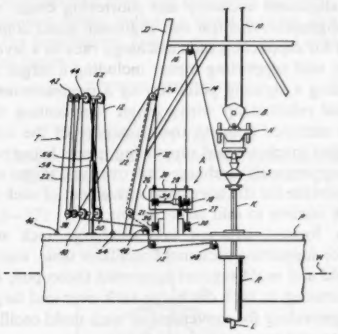
lower in rolling contact with said cam surface on said master cam, means rotatably supporting said drive shaft, drive means connected with said drive shaft for rotating the drive shaft and cam follower thereby moving the cam follower and cam surface in relation to each other, a control cam having a control cam surface thereon, means supporting said control cam in axially spaced, fixed relation to the master cam with the control cam surface being in radially opposed relation to the master cam surface, a control cam follower, means supporting said control cam follower in rolling contact with said control cam surface with the control cam follower being freely rotatably supported by its supporting means, said supporting means for the cam follower including a movable mounting member rotatably journaling said control cam follower, housing means, rotatably connected to said drive shaft means movably supporting said mounting member from said housing means, and spring means connected between said mounting member and said housing means to resiliently bias the mounting member in one direction to resiliently retain the control cam follower in rolling contact with the control cam surface and to resiliently bias said master cam follower in the opposite direction into rolling contact with said master cam.

4,085,509

APPARATUS FOR COMPENSATING FOR THE HEAVING OF A FLOATING DRILLING PLATFORM FOR CONNECTION WITH APPARATUS FOR MEASURING THE RATE OF PENETRATION OF PIPE RUN INTO AN OFFSHORE WELL

Leo A. Bell, and Norbert C. Peterson, both of Santa Ana, Calif., assignors to Martin-Decker Company

Filed Apr. 7, 1976, Ser. No. 674,490
Int. Cl.[2] G01B 3/12
U.S. Cl. 33—134 R **12 Claims**



1. A heave compensating apparatus for use in measuring the rate of penetration of drill pipe run into a well situated beneath a floating drilling platform heaving relative to a stationary riser pipe located beneath the platform, wherein a derrick support assembly including a swivel is mounted on such platform for supporting such drill pipe in such riser pipe, comprising:

a first measuring wheel adapted for mounting on such platform and a first measuring line in operable engagement therewith, said first measuring line adapted for extending from said first measuring wheel to such swivel for measuring relative movement between such platform and such drill pipe;

a second measuring wheel adapted for mounting on such platform having a second measuring line in operable engagement therewith, said second measuring line adapted for extending from said second measuring wheel to such riser pipe for measuring relative movement between such riser and such platform;

said first and second measuring lines providing linear responses indicative of relative movement between such platform and such swivel and between such platform and such riser, said measuring wheels being mounted for rotation for converting said linear response into rotational response;

resultant rotation means operatively connecting said first and second measuring wheels for providing a resultant rotation indicative of actual drill pipe movement; and

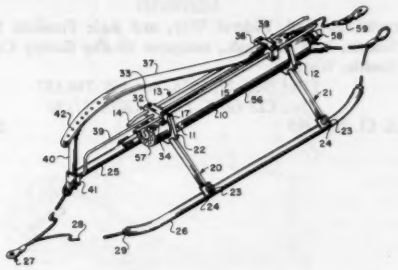
said second measuring wheel being adjustable to a circumference whereby there is no rotation of said resultant rotation means when the platform heaves about and pipe movement relative to the stationay riser pipe is caused only by platform heave.

4,085,510

DEFLECTION DEVICE FOR MEASURING THE INTERIOR OF A CONDUIT

John A. Kirschke, P.O. Box 125, Boerne, Tex. 78006

Filed Jul. 26, 1976, Ser. No. 708,717
Int. Cl.[2] G01B 5/12
U.S. Cl. 33—178 F **8 Claims**



1. A deflection device for measuring the interior of a conduit having a central axis substantially parallel to the earth's surface, said conduit having a top portion above said central axis and a bottom portion below said central axis, said deflection device comprising:

a. an elongated central body projecting on the said central axis of said conduit, said elongated central body mounted on,

b. elongated skid means supporting said central body movably in the said bottom portion of said conduit,

c. a spring loaded deflection arm mounted on said elongated body, said spring loaded deflection arm projecting away from said skid means and being biased into contact with, the top portion of said conduit, and moving responsive to said deflection arm contacting a surface, and

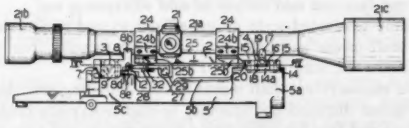
d. an elongated ruler fixedly attached at one end to said deflection arm and operatively connected to said body to extend toward said central axis, said ruler moving responsive to movement of said deflection arm.

4,085,511

TELESCOPIC SIGHT GUN MOUNT

Joseph L. Kovac, 606 Beech Dr., Trafford, Pa. 15085

Filed Oct. 14, 1976, Ser. No. 732,207
Int. Cl.[2] F41G 1/38
U.S. Cl. 33—250 **10 Claims**



1. A mount for readily attaching a telescopic sight to a gun and for quickly detaching the telescopic sight from the gun comprising, first and second saddle means spaced apart and

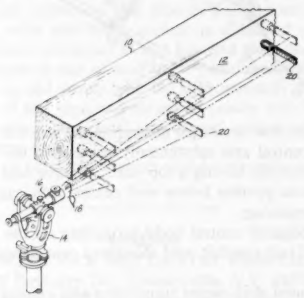
fixedly secured to the gun, said first saddle means having a rearwardly facing angular contact edge, said second saddle means having a forwardly facing flat deflectable leaf member and a locking lip adjacent to said leaf member and extending orthogonally to the plane of said leaf member, an elongated carrier having one end formed to agree and to abut with said angular contact edge, and a manipulatable lever pivotally connected at the other end of said elongated carrier for movement about an axis extending orthogonally to the plane defined by said locking lip and having a portion for frictionally engaging said locking lip and deflecting said flat deflectable leaf member whereby said elongated carrier and the telescopic sight are positively locked in fixed relationship with said first and said second saddle means.

4,085,512

LUMBER CUTTING MEASUREMENT APPARATUS AND METHOD

Dennis Lee Bod, Federal Way, and Kale Franklin Skutley, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 27, 1976, Ser. No. 754,137
Int. Cl.[2] G01C *15/06;* G01B *11/30*
U.S. Cl. 33—293 **2 Claims**



1. Lumber cutting measurement apparatus comprising:

a body portion having

a workpiece contacting, forward end, a rearward, scale end, with a longitudinal axis extending therebetween, and being of the character to be hand-held against a surface of said workpiece;

measurement shaft means disposed partially within said body portion and being axially movable along said axis and having

a workpiece contacting end face movable from a point axially outward from said workpiece contacting forward end of said body portion to a point axially therewithin;

spring means carried by said body portion in axially forwardly urging engagement with said measurement shaft means for causing a compressive, with a repeatably constant force, contact between said workpiece contacting end face and said surface of said workpiece; and

axially graduated scale means affixed to said measurement shaft means and extending axially rearwardly from said rearward, scale end of said body portion;

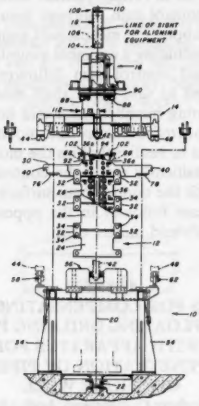
said measurement shaft means further including articulation means disposed contiguously to said workpiece contacting end face for providing a rotational, swivel type freedom of adjustment movement of said measurement apparatus while maintaining said compressive contact between said end face and said workpiece.

4,085,513

CONTINUOUS CASTER-ALIGNMENT APPARATUS

Alfred J. Capriotti, Falls Township, Bucks County, and Louis G. Lazzaretti, Harmony Township, Beaver County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 596,035, Jul. 14, 1975, Pat. No. 3,967,362.
This application Mar. 3, 1976, Ser. No. 663,390
Int. Cl.[2] B22D *11/12;* G01C *15/00*
U.S. Cl. 33—286 **6 Claims**



1. A test and alignment stand for use in a continuous casting plant for prealigning and supporting a discharge rack, a mold oscillator table, a mold support and a mold prior to their placement within a continuous-casting machine for providing greater alignment accuracy and shortening caster downtime during alignment, said test and alignment stand comprising:

means for supporting such discharge rack in a level orientation, said supporting means including a target means including a sighting point having a predetermined dimensional relationship with a point representing the center line entrance point to the remainder of the continuous-casting machine, said supporting means being configured to support such discharge rack over said target means and to provide for the horizontal movement of such discharge rack relative to said target means;

means, located adjacent said discharge rack supporting means, for supporting such mold oscillator table, together with such mold and mold support supported thereupon, in overlying relationship to such discharge rack over said target means and for providing for movement of such mold oscillator table relative to said target means; and

means for horizontally adjusting such mold oscillator table relative to said target means and to such discharge rack, the adjustment of such mold oscillator table relative to said target means also resulting in horizontal adjustment of such mold and such mold support which are supported upon such mold oscillator table.

4,085,514

PARALLEL WALL INDICATOR

Boris T. Stefanoff, 16039-132nd Pl. SE., Renton, Wash. 98055

Filed Nov. 14, 1975, Ser. No. 631,994
Int. Cl.[2] G01B *3/56;* G01C *9/12;* A61C *3/00*
U.S. Cl. 33—343 **11 Claims**

1. A dental instrument, comprising:

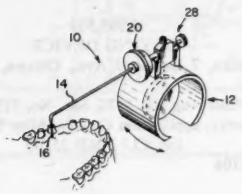
indicator means including an elongated portion of length sufficient to be insertable into a mouth with one end portion thereof adjacent a prepared tooth, and a pointer portion projecting from said one end portion for indicating a reference line;

pendulum means movable with respect to a rest position

about a pivot axis parallel to the longitudinal axis of said elongated portion; and

connector means for connecting the other end portion of said elongated portion with said pendulum means such that said pointer portion will be positioned at a predetermined angular position with respect to vertical when said pendulum means assume said rest position during successive comparisons of the angular disposition of said reference line with the angles of inclination of corresponding prepared teeth surfaces.

10. In a geometric instrument including pendulum means, and a pointer positionable by said pendulum means at an angu-



lar position with respect to vertical when said pendulum means assume a rest position, the improvement comprising:

connector means connected to said pendulum means and said pointer for permitting selective movement of said pointer with respect to said pendulum means in order to selectively adjust the angular position at which said pointer will be positioned when said pendulum means assume said rest position;

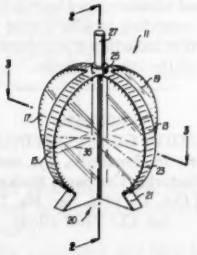
said pointer including an elongated portion and a pointer portion projecting from said elongated portion;

said pendulum means swinging about a pivot axis spaced from the longitudinal axis of said elongated portion and parallel thereto.

4,085,515
ALIGNMENT DEVICE

Donald R. Darden, 519 Corday St., Lot 3, Pensacola, Fla. 32503

Filed Jan. 17, 1977, Ser. No. 759,880
Int. Cl.[2] G01C *9/22*
U.S. Cl. 33—377 **5 Claims**



1. An alignment device comprising

a plurality of hollow transparent arcuate sections, each of said sections comprising;

substantially parallel side walls joined at their perimeters by an arcuate outer wall; said sections being secured together at the inner edges of adjacent side walls so as to form a common hollow central section;

a base secured to and supporting said arcuate sections;

an aperture in said instrument for admission of a liquid;

scalar indicia about the outer edges of each of said arcuate sections;

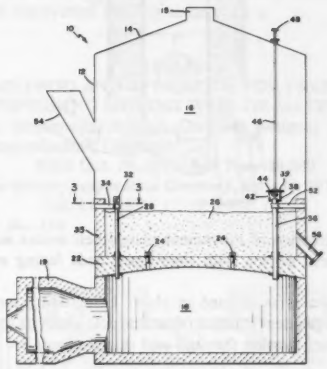
means in said device for removably retaining a rigid rod, said rod being adapted for insertion into the chuck of a drill; and

means within said hollow central section for restricting fluid flow between said arcuate sections.

4,085,516
FLUIDIZED BED DRYING PROCESS FOR POROUS MATERIALS

Walfred Wilhelm Jukkola, Westport, and Richard Ernest Svencer, Norwalk, both of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Sep. 30, 1976, Ser. No. 728,332
Int. Cl.[2] F26B *3/08*
U.S. Cl. 34—10 **2 Claims**



1. A fluidized bed drying process for moist, porous, particulate materials comprising the steps of, providing a body of fine particulate solids composed of said moist, porous materials, heating a gas to a temperature in the range from about 1200° to about 2000° F, passing a major portion of said hot gas through said body of particulate solids to fluidize same and establish in the fluidized body a temperature in the range from about 160° to about 325° F whereby large quantities of moisture are evaporated from said fluidized body, said gas, in moving through said fluidized bed, elutriating fine, moist particles of said particulate solids into the freeboard region above said bed, introducing a second smaller portion of said hot gases into a conduit traversing said fluidized bed and discharging this portion directly into the freeboard region above said fluidized bed in a volume sufficient to maintain in said freeboard region a temperature in the range from about 160° up to about 325° F so that the fine particles elutriated from said fluidized body are subjected to the temperature prevailing in the freeboard region and evaporation of moisture from said fine particles continues in said freeboard region and in the exhaust gas system.

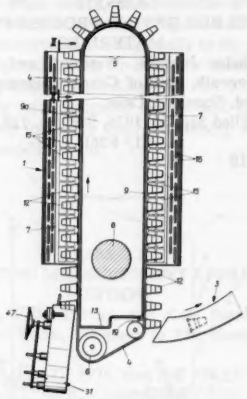
4,085,517
ARTICLE TREATMENT APPARATUS

Alfons W. Thiel, Mainz; Hans Martini; Peter Wolf, both of Wiesbaden, and Albert Runkel, Mainz, all of Germany, assignors to Bellaplast GmbH, Wiesbaden, Germany

Filed Aug. 23, 1976, Ser. No. 716,565
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—21 **23 Claims**

1. Apparatus for the heat treatment such as drying of cup-shaped articles that have had a surface treatment of heat-sensitive material, such as printing or coating, comprising a heat treatment device having tunnel means containing moving article transporting apertured belt means and associated suction means disposed for acting through said belt means for holding said articles in inverted position on said belt means to transport said articles in a predetermined direction between an inlet and an outlet of said tunnel means and means in the tunnel

means for heat treating the moving articles, in combination with means for feeding a succession of said surface treated articles into said device at said inlet in such predetermined orientation that said articles are transferred to said belt means while moving laterally at substantially the same speed and in



the same direction of movement as said belt means and enter said treatment device with their open ends facing said belt means.

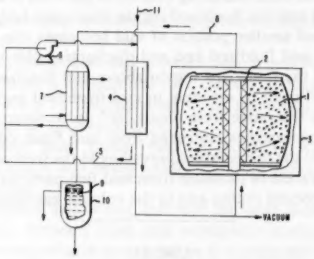
15. Apparatus as defined in claim 1, including means for causing independent rotation of each article about its longitudinal axis which passing through said tunnel means.

4,085,518

DRYING OF WATER-WET SOLID MATERIALS

Harold L. Jackson, Hockessin, Del., and Frederick W. Mader, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 8, 1976, Ser. No. 721,441
Int. Cl.[2] F26B *5/00*
U.S. Cl. 34—37 **9 Claims**



1. Process of drying water-wet solid materials, which process comprises, in a system,

a. forcibly contacting the water-wet solid material with circulating vapor of a fluorocarbon having a fluorine to carbon atom ratio of at least 1.0 and a boiling temperature of less than about 80° C at atmospheric pressure, said fluorocarbon vapor being at a temperature above about 100° C and said contacting being carried out in the absence of a substantial amount of a noncondensable gas,

b. passing the resulting mixture of fluorocarbon vapor and water vapor from step (a) through a zone maintained at a temperature less than 100° and at least 1° C above the atmospheric pressure boiling temperature of the fluorocarbon to condense a substantial portion of the water vapor but not a substantial portion of the fluorocarbon vapor,

c. heating the vapor mixture from step (b) to a temperature above about 100° C and recycling the mixture to step (a),

d. repeating steps (a), (b) and (c), while maintaining substantially constant in the system the amount of fluorocarbon vapor, until the solid material is substantially free of water and contains only fluorocarbon vapor on its surfaces and-/or occluded in its interstices, and thereafter

e. removing and recovering from the solid material the fluorocarbon vapor values and

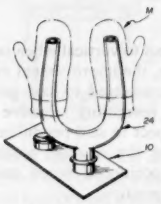
f. recovering solid material which is substantially free of water and fluorocarbon.

4,085,519

DRYING DEVICE

Nicholas Masika, 7 Desmond Ave., Ottawa, Ontario, Canada (K2B 7W6)

Filed Aug. 18, 1976, Ser. No. 715,618
Claims priority, application Canada, May 7, 1976, 252009
Int. Cl.[2] F26B *25/00*
U.S. Cl. 34—104 **3 Claims**



1. An ariticle drying device adapted for use in association with a household forced hot air furnace, said device comprising a cover plate for fitting over and completely enclosing an air outlet of a forced hot air furnace, said cover plate being in the form of a flat rectangular plate with a rectangular flange extending downwardly from the bottom face thereof, said flange being adapted to extend into a rectangular furnace outlet in close proximity to the edges thereof, at least one circular hole in said cover plate with a tubular sleeve fixed therein and a nozzle member mountable in said tubular sleeve, said nozzle member being an elongated tublar member, one end thereof including a cylindrical tubular portion snugly engagable with said tubular sleeve and the other end merging into an angularly extending tubular nozzle portion, said cylindrical tubular portion including a peripheral abutment ring for engaging the top of the tubular sleeve.

4,085,520

ANTI-POLLUTION GRAIN DRYING APPARATUS

Charles F. Lambert, Jr., Louisville, Ky., assignor to Clayton & Lambert Manufacturing Company, Buckner, Ky.

Filed Oct. 13, 1976, Ser. No. 731,552
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—79 **10 Claims**

1. An anti-pollution grain drying apparatus comprising:

A. a grain drying bin having a perforated floor through which hot air is blown upwardly for drying purposes;

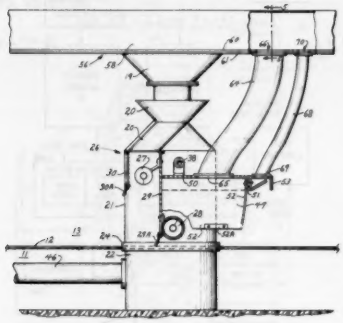
B. a rotary sweep mounted in the bin for sweep movement over the floor, said sweep having distributing means on its lag side for distributing wet grain over the floor and radially-extending retrieving means on its lead side for removing dried grain from the floor;

C. means for feeding wet grain to said distributing means;

D. means for receiving dried grain from said retrieving means and conveying said grain outside of the bin; and

E. an anti-pollution suction system for removing and capturing dust coming from grain adjacent the sweep, said system including

1. a suction chamber embracing dust created adjacent the sweep, and
2. anti-pollution means for suctioning air and dust from the suction chamber and conducting it into equipment for separating dust from the air and capturing the dust, said



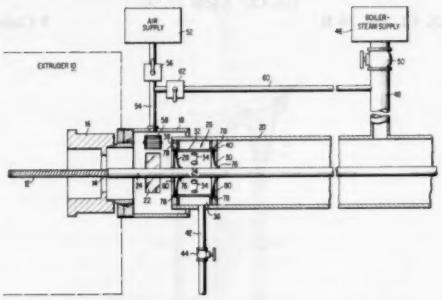
anti-pollution means having intercommunicating conduits including
a. a 1st conduit carried by the sweep for rotation therewith, and
b. a 2nd conduit stationarily supported within the bin.

4,085,521

AIR-STEAM INTERFACE IN CONTINUOUS VULCANIZATION PROCESS FOR ALLOWING ACCURATE OPTICAL MEASUREMENTS

David H. Neuroth, Theresa, N.Y., assignor to Harvey Hubbell Incorporated, Orange, Conn.

Filed Oct. 12, 1976, Ser. No. 731,220
Int. Cl.² F26B *19/00*
U.S. Cl. 34—89 **7 Claims**



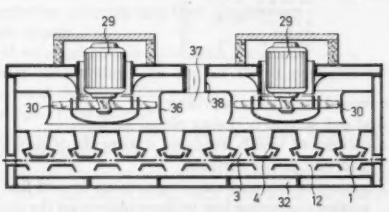
1. An apparatus for permitting unobscured observation of a product being treated in a high temperature, high pressure atmosphere, comprising:
chamber means for containing said high temperature, high pressure atmosphere,
baffle assembly means for defining a buffer region substantially closing one end of said chamber means,
observation housing means including an observation window coupled to said baffle assembly so that said buffer region is positioned between said observation housing means and said chamber means; and
fluid flow means coupled to said chamber means, said baffle assembly means and to said observation housing means for establishing a leakage flow from said chamber means and from said observation housing means into said buffer region whereby said high temperature, high pressure atmosphere is prevented from influencing conditions within said observation housing means, said fluid flow control means comprising,
a high pressure air supply,
an air line coupling said air supply to said observation housing means for establishing a high pressure air atmosphere within said observation housing means,
a high pressure, high temperature steam supply,
a steam line coupling said steam supply to said chamber means for establishing said high pressure, high temperature atmosphere therein,
slits in said baffle assembly means for allowing leakage of steam and air into said buffer region,
an exhaust line coupled to said buffer region for removing steam and air therefrom; and
a start-up line coupled between said steam line and said air line for allowing steam to be selectively introduced into said observation housing means.

4,085,522

METHOD AND APPARATUS FOR FREELY SUSPENDING MOVING WEBS OF MATERIAL

Joachim Stroszynski, Naurod, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Oct. 29, 1973, Ser. No. 410,340
Claims priority, application Germany, Oct. 30, 1972, 2253170
Int. Cl.² B65H *17/32*; F26B *17/10*
U.S. Cl. 34—156 **29 Claims**



1. A method for freely suspending a moving web of material in a gaseous medium, which comprises impinging, by means of a stable emitting system, a stream of gaseous medium onto the surface of the web from one side only in order to produce at least one stationary stable pressure zone, in which a repelling force decreases continually with an increasing distance from the emitting system,
forming at least one stationary stable suction zone adjacent said stationary pressure zone, in which a suction force decreases continually with an increasing distance from means forming the suction zone to a smaller degree than the repelling force in the pressure zone,
and regulating the applied stable pressure of the stable emitting system and the suction of the stable suction zone in order to make the repelling force equal to the suction force at the zone where the web is freely suspended between the emitting system and the means forming the suction zone.

4,085,523

TEACHING MACHINE

Ernest R. Duncan, Harmony Hill, Mount Harmony Rd., Bernardsville, N.J. 07924

Division of Ser. No. 641,280, Dec. 16, 1975, Pat. No. 3,977,092, which is a division of Ser. No. 382,273, Jul. 24, 1973, Pat. No. 3,925,909. This application Aug. 24, 1976, Ser. No. 717,386
Int. Cl.² G09B *7/02*
U.S. Cl. 35—9 A **5 Claims**

4. An educational system which comprises the combination of a record member and a teaching machine having:
a housing adapted to receive a record member;
an incremental advancement means connected to said hous-

ing for advancing a record member received in said housing;

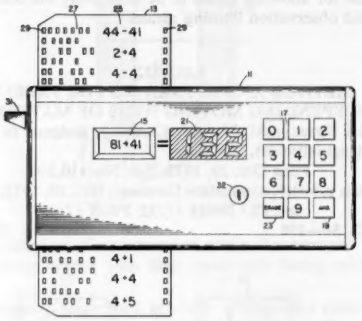
a keyboard on said housing, in which a student enters one at a time on said keyboard the answers to a plurality of problems serially presented to him;

a display on said housing, constructed and arranged for displaying the answers to said problems when the correct answer is entered; and

actuatable interrogating means comprising:

means for counting the number of answers attempted and number of correct answers entered by the student on said keyboard; and

actuatable means for enabling the display on said display of the contents of said counting means;



the record member comprising:

first and second opposing planar surfaces;

a column of visibly readable statements of problems on said first planar surfaces;

a column of machine readable answers on said first planar surface corresponding to the problems on the column of visibly readable statements of problems;

indexing means on said record member to enable incremental advancement of said record member; and

the machine readable answers in said column of answers being displaced from the corresponding visibly readable statement of a problem in said column of problems to impede visual decoding of the machine readable answer.

4,085,524

SIMULATED DIGITAL RADAR SYSTEM WITH EARTH CURVATURE AND ATMOSPHERIC EFFECTS

Jerome W. Meyer, Santa Clara, Calif., assignor to The Singer Company, Binghamton, N.Y.

Division of Ser. No. 499,302, Aug. 21, 1974, abandoned. This application Jun. 4, 1976, Ser. No. 692,817

Int. Cl.[2] G01S *9/00*

U.S. Cl. 35—10.4 **5 Claims**

1. An earth curvature correction circuit adapted for use in a digital radar landmass system for accumulatively decreasing the terrain elevation of each range point thereof to simulate the effect of the earth's curvature, comprising:

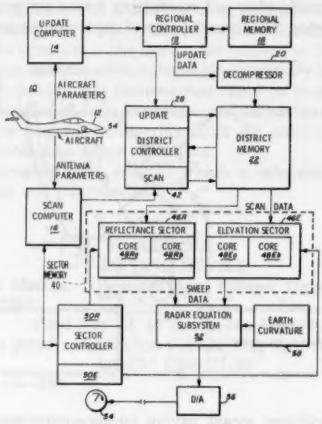
a range point counter having an output which increases during each sweep line and which remains proportional to the current range point;

a curvature control having an output proportional to the desired radius curvature;

a multiplier which forms the product of the range output of the counter and the curvature output of the control;

an adder which forms the sum for each range point of the multipler product plus the multiplier product for the previous range point; and

output register for temporarily holding the sum for each range point for outputting and for returning each sum to



the adder to be added to the next range point product to form the next range point sum.

4,085,525

SHOE SUPPORT

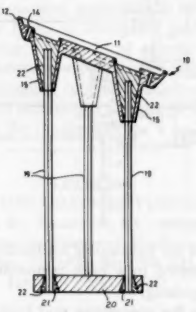
Horace Allan Wilkinson, 13 Korocan Rd., Lilli Pilli, Sydney, New South Wales, Australia (2229)

Filed Jul. 14, 1976, Ser. No. 705,208

Claims priority, application Australia, Aug. 11, 1975, PC2728

Int. Cl.[2] A43B *21/00*

U.S. Cl. 36—34 R **9 Claims**

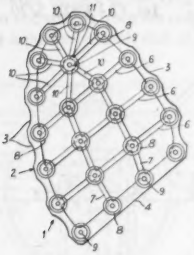


1. A shoe support comprising an upper support member; a lower support member; a plurality of column members extending between said support members, each of said column members being an elongated rod straight throughout the entire length thereof; at least one of said support members including portions defining cavities receiving the ends of said column members and having sufficient dimension to permit alignment of said column members therein over a range of angles to accommodate various heel elevations; and a hardenable adhesive material within at least some of said cavities and surrounding said column ends to anchor said column ends within said cavities.

4,085,526
SOLE FOR ATHLETIC SHOE

Lorenz Hemmer, Ottersthal-Saverne, France, assignor to Adidas Fabrique de Chaussures de Sport, Landersheim, France

Filed Jul. 30, 1976, Ser. No. 710,145
Claims priority, application France, Aug. 1, 1975, 75 24910; Aug. 7, 1975, 75 25290
Int. Cl.² A43B 23/28
U.S. Cl. 36—59 R 8 Claims

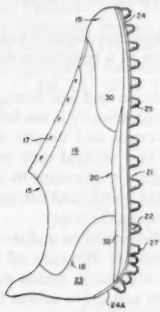


1. Inner sole adapted to be used in a sole for an athletic shoe, which inner sole is made of a hard synthetic material and has a shape corresponding to the shape of the front half of the sole and a flat reticular structure with large meshes, the junction zones of which form supporting zones for cleats which project from the structure perpendicular to its plane and are integral therewith.

4,085,527
ATHLETIC SHOE

Donnie E. Riggs, 1606 Monteval Ct., San Jose, Calif. 95120

Filed Feb. 1, 1977, Ser. No. 764,696
Int. Cl.² A43B 5/00, 23/28, 13/04
U.S. Cl. 36—114 7 Claims

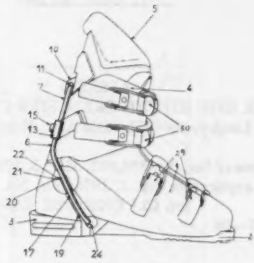


1. An athletic shoe comprising in combination:
a shoe upper portion having heel, shank and toe areas and forming a cavity for receiving the foot;
a sole attached to said shoe upper portion for supporting the foot on the running surface, said sole comprising;
a cushioning pad of resilient material fixed to the upper portion;
a plurality of compressible cleats fixed to the bottom side of said cushioning pad and projecting downward to contact the running surface, said cleats being distributed throughout the area of the sole between the heel and the toe portions of the shoe; and
said cleats at the heel portion of the shoe being of at least two different heights and being intermingled such that the longer cleats will contact the running surface first to provide a first cushioning action and upon compression, will permit the shorter cleats to contact the running surface to provide additional cushioning action for the foot.

4,085,528
SKI-BOOT

Marc Delery, Caluire, France, assignor to Trappeur, S. A., St-Etienne de St-Geoirs, France

Filed Oct. 1, 1976, Ser. No. 728,738
Claims priority, application France, Nov. 4, 1975, 75 34375
Int. Cl.² A43B 5/04
U.S. Cl. 36—121 18 Claims

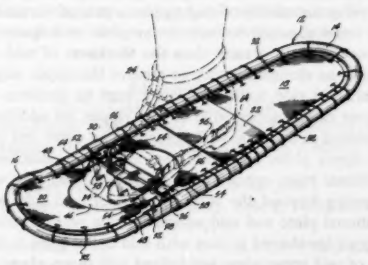


1. An injection molded ski-boot of plastics, and preferably thermoplastics material, said boot comprising:
a rigid upper;
a rigid sole and heel integral with the upper;
a collar surrounding the top of the upper, effective to surround the leg of the wearer;
a U-shaped reinforcement;
a horizontal base on said reinforcement which extends through the sole near the heel;
limbs on the reinforcement which extend towards the top of the boot, said limbs being each situated at the rear of the boot, and which bear firmly against a major portion of the rear of the upper of the boot, one on each side of the longitudinal centre-line of the boot; and an upper arm on each limb, each upper arm being secured at a free end near to the top of the rear of the upper; and
means on each side of the upper for adjustment of the position of the limbs.

4,085,529
SNOWSHOE

Fred C. Merrifield, 8746 Overlade Dr. W., Bellevue, Wash. 98004

Filed Nov. 19, 1976, Ser. No. 743,335
Int. Cl.² A43B 5/04
U.S. Cl. 36—125 34 Claims



1. In a snowshoe having a rigid frame, said frame including a pair of spaced side members, a toe portion and a heel portion, the improvement comprising:
decking having a peripheral portion sized to fit within at

least a portion of said frame, said decking having a plurality of spaced apertures in said peripheral portion adjacent said frame,

a plurality of discrete tie members passing around at least a portion of said frame, each of said tie members passing through only one of said apertures and being wrapped around said frame to secure said decking to said frame and for positioning said decking between the side members of said frame.

4,085,530

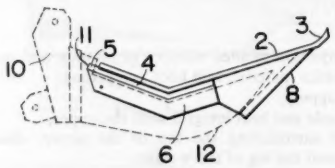
BACK HOE RIPPER-TRENCHER CONVERTER

Ronald L. Landry, 1604 Glendale Ave., Windsor, Ontario, Canada

Continuation of Ser. No. 554,983, Mar. 3, 1975, abandoned. This application Sep. 2, 1976, Ser. No. 720,052

Int. Cl.² E02F *5/02, 9/28*

U.S. Cl. 37—98 **1 Claim**



1. In combination, a ripper of a back-hoe machine and a converter for converting the ripper to a ripper-trencher for digging a trench of predetermined width, said ripper having an upper edge with a sharp bend therein forming an obtuse angle, an inner end, and a horn-shaped outer end, the inner end of said ripper having a hole therein and a reentrant cavity adjacent the upper edge; said converter comprising an elongate, flat rectangular upper plate having an inner end and terminating at an outer end in a sharp-edged digger, said upper plate having a sharp bend therein forming an obtuse angle substantially equal to the obtuse angle of said upper edge, the width of said upper plate and the digger being of the same width and substantially equal to the width of the trench to be dug, a separate lower plate attached to the lower surface of said upper plate and being narrower and shorter than said upper plate, said lower plate also having a sharp bend therein forming an obtuse angle substantially equal to the obtuse angle of said upper plate, said lower plate extending a short distance beyond the inner end of the upper plate to form a ledge, said ledge being received in said reentrant cavity of said ripper, a pair of vertical, parallel side walls attached to said lower plate and spaced apart a distance slightly greater than the thickness of said ripper to provide an elongate cavity to receive the upper edge of said ripper, said side walls also being bent to conform with the contour of the upper edge of said ripper, an additional plate positioned at an angle with respect to an outer end portion of said upper plate, and additional side walls attached to said additional plate, spaced outwardly from said side walls, and extending beyond the forward ends of said side walls, said additional plate and said additional side walls forming a hollow, wedge-shaped pocket with said upper plate at the underside of said upper plate just behind said sharp-edged digger to receive and contain therein the horn-shaped end of said ripper, said side walls of said converter having holes therein positioned to be aligned with said ripper hole when said horn-shaped end of said ripper is received in said wedge-shaped pocket.

4,085,531

GRAVE DIGGING MACHINE

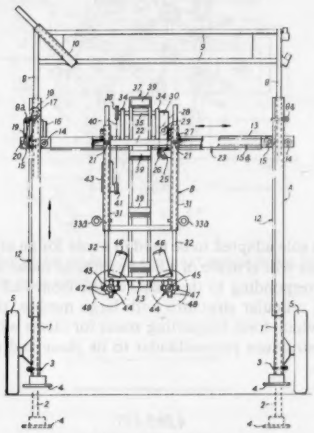
Georges Aubert, La Cerisae, 71570 La Chapelle, Pontanevaux, France

Continuation-in-part of Ser. No. 631,343, Nov. 12, 1975, abandoned, which is a continuation of Ser. No. 536,693, Dec. 26, 1974, abandoned, which is a continuation of Ser. No. 422,905, Dec. 7, 1973, abandoned. This application Mar. 14, 1977, Ser. No. 777,107

Claims priority, application France, Sep. 14, 1973, 73 34049

Int. Cl.² E02F *5/20*

U.S. Cl. 37—190 **2 Claims**



1. A grave digging apparatus comprising, in combination:

(i) a supporting frame including:

(a) two side frame structures spaced transversely of the frame

(b) two cross-bars disposed one at each end of the frame and connected releasably to the lower part of each side frame structure

(c) two upper cross-members engaged releasably with the side frame structures at a respective end of the frame, and

(d) vertical rack means on said side frame structures;

(ii) a carrier disposed longitudinally in the frame between the two side frame structures, said carrier including pinion means meshing with said vertical rack means, and drive means connected to the pinion means to drive the carrier up and down within the frame; said carrier further including horizontal rack means thereon;

(iii) a digging assembly supported on and movable along said carrier in the longitudinal direction of the frame, said digging assembly having pinion means meshed with said horizontal rack means and drive means for rotating said pinion means for driving the digging assembly along the carrier, said digging assembly including a sub-frame, a rigid structure telescopically vertically slidable with respect to said sub-frame, a belt and bucket excavator carried on said sub-frame and on said rigid structure, and means for driving said belt and bucket excavator.

4,085,532

EMBROIDERY HOOPS

Bruce Hehn, 110 Shepherd Ter., St. Clairsville, Ohio 43950

Filed May 3, 1977, Ser. No. 793,245

Int. Cl.² D05C *1/04*

U.S. Cl. 38—102.2 **1 Claim**

1. In hoop means for tensioning a portion of embroidery fabric and the like including an outer ring formed by a yieldable material having a circumferential inner surface adapted to clamp the fabric over and against a cooperating circumferen-

tial outer surface of an inner ring, the improvement which comprises a cylindrical outer ring having:

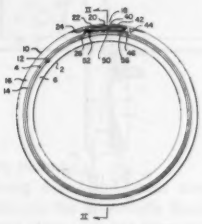
(i) two ends formed by a radial discontinuity in the ring;

(ii) an outer circumferential surface;

(iii) a radially extending circumferential rib around the outer circumference surface of the ring;

(iv) an axially extending circumferential segment on the outer edge of the radial rib adjacent each end thereof;

(v) a first raised abutment extending outwardly from the outer circumferential surface of the ring to each circumferential segment and spaced from the radial discontinuity, thereby forming a pocket at each end of the ring;



(vi) the radially extending rib having an opening in each pocket adjacent to each first raised abutment; and

(vii) a second raised abutment intermediate each opening and radial discontinuity, said ring being in combination with a coil spring having ends which project tangentially from the coil on the same side of the axis of the coil, each end being turned back on itself to form a hook whereby the spring may be placed in the pockets formed by ring, the circumferential segments, and the first raised abutment with the ends of the springs extending through the openings and engaging the second raised abutments.

4,085,533

DEVICE FOR PRODUCING AESTHETIC EFFECTS

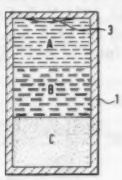
Alfred Ewald, 62 Wiesbaden Nerotal 3, Germany

Filed Nov. 24, 1975, Ser. No. 634,642

Claims priority, application Germany, Nov. 25, 1974, 2455638

Int. Cl.² G09F *13/24*

U.S. Cl. 40—406 **39 Claims**



1. A device for producing visual aesthetic effects said device comprising a vessel with a wall which transmits light, said vessel containing at least two liquids of different density which are not completely and not permanently miscible with each other, and said device resulting from the bringing together in said vessel at least three liquids wherein said three liquids include at least one from each of the following three groups:

(a) liquid paraffin, silicone oil, naphthene, and hexachlorobutadiene;

(b) water, and an ether;

(c) an ester with chemically bound phosphorus, an ester with chemically bound halogen, an ester with chemically bound phosphorus and halogen, an ester of phthalic acid, a carbonic acid ester, ethanediolmonophenylether, and tetrahydrothiophene-1, 1-dioxide; wherein the said at least three selected liquids are not completely and not permanently miscible with each other.

4,085,534

DATA CARRIER HOLDER

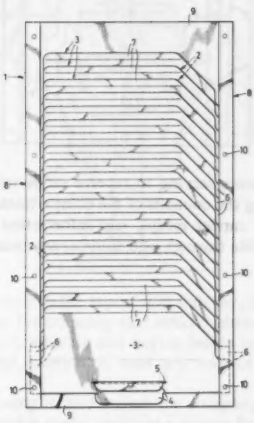
Werner Willi Gustav Eckstein, Coburg, Neuses, and Dieter Klaus-Jürgen Schweinsberg, Lautertal-Unterlauter, both of Germany, assignors to Eichner Organisation KG, Coburg, Germany

Filed May 18, 1976, Ser. No. 687,595

Claims priority, application Germany, Dec. 18, 1975, 2557065

Int. Cl.² G09F *1/10*

U.S. Cl. 40—124.2 **1 Claim**



1. A holder for data carriers which comprises

a plurality of flexible, plastic members arranged adjacent one another; each member being of approximately rectangular shape so as to have top, side and a bottom edges and each having both a tongue projecting away from the bottom edge and a slot positioned above the tongue so as to extend in a lateral direction, each slot extending laterally at least the same length as the length of the tongue; said members being arranged such that the tongue of one member is inserted into a slot of an adjacent member so as to form holder compartments for data carriers therebetween; each member having fastening flaps projecting from both side edges thereof at a point near the bottom edge; each member having a beveled corner between the top edge and a side edge; and each member having a portion of the top edge bent outwardly at a slight angle away from a plane formed by the member; and

securing means extending along both the side edges of the plurality of members and engagable with fastening flaps of each member to secure said members into a holder.

4,085,535

DATA CARRIER HOLDER

Dieter Klaus-Jürgen Schweinsberg, Lautertal-Unterlauter, Germany, assignor to Eichner Organisation KG, Coburg, Germany

Filed May 18, 1976, Ser. No. 687,596

Claims priority, application Germany, Feb. 2, 1976, 2603794

Int. Cl.² G09F *1/10*

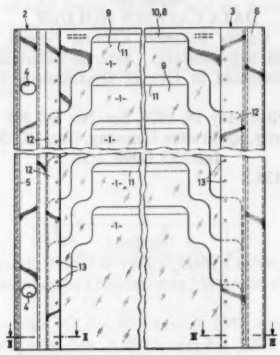
U.S. Cl. 40—124.2 **2 Claims**

1. A data carrier holder which comprises:

a plurality of overlapping, generally V-shaped slip-in data carrier means inserted within each other, each of said data carrier means providing a compartment for receiving data carriers;

generally V-shaped transparent means positioned to cover

the outer surfaces of each of said data carrier means and able to form a pocket therebetween, said pocket formed between each said transparent means and each said data



carrier means serving to receive strips with information identifying the contents of the compartment in the associated data carrier means, said information on said strips being visible through said transparent means.

4,085,536

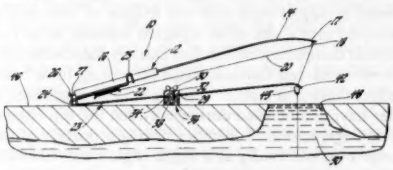
AUTOMATIC FISHING DEVICE

Everett J. Wood, Jr., Rte. No. 2, Box 342, Hillman, Mich. 49746

Filed Dec. 13, 1976, Ser. No. 750,290

Int. Cl.[2] A01K *97/00*

U.S. Cl. 43—15 **8 Claims**



1. An automatic fishing device comprising, in combination, a support; a fishing rod comprising a handle and a tip; a fishing line secured to said fishing rod and extending from said tip; a spring having elongated first and second ends thereof in a first predetermined angular position therebetween and a resilient section between said spring ends whereby flexing of said resilient section changes said angular position; means for securing said first spring end to said support; means for securing said fishing rod handle to said second spring end; and trigger means for holding said fishing line in tension whereby said fishing rod handle and said second spring end are held against resilient forces of said resilient section in a second predetermined angular position relative to said first spring end and said fishing rod handle and second spring end are released upon pulling of said fishing line so that a pull on said fishing line releases said fishing rod and said second spring end and permits said resilient section to move said second spring end from said second predetermined position to said first predetermined position.

4,085,537

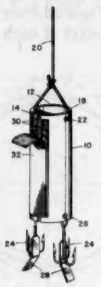
FISHING LURE RETRIEVER

Harry V. Todd, 2429 Windmill View, El Cajon, Calif. 92020

Continuation-in-part of Ser. No. 686,584, May 14, 1976, abandoned, which is continuation-in-part of Ser. No. 643,548, Dec. 22, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,796

Int. Cl.[2] A01K *97/00*

U.S. Cl. 43—17.2 **4 Claims**



1. A fishing lure retriever comprising:

(a) a side wall defining a non-buoyant tubular member having a front end and a rear end and a longitudinal slot extending therethrough;

(b) means for retaining a fishing line inserted through said slot within said tubular member; and

(c) a plurality of spaced swivel mounted hooks depending from the rear edge of said member;

(d) each of said hooks having a deflector element attached thereto and angled rearwardly and outwardly from the axis of said tubular member to cause said hooks to expand when lowered through the water to straddle a lure on the end of a fishing line and expose an unobstructed corridor defined by said tubular member to receive a lure, said deflector elements also acting to deflect said hooks together into engagement with a lure positioned therebetween when said retriever is raised through the water.

4,085,538

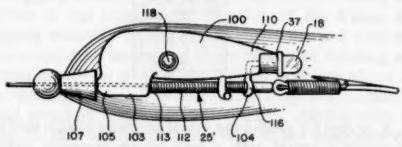
FISHING LURE

Tadeusz R. Jankowski, 2054 N. LaCrosse, Chicago, Ill. 60039

Filed Jul. 19, 1976, Ser. No. 706,695

Int. Cl.[2] A01S *85/01*

U.S. Cl. 43—17.6 **5 Claims**

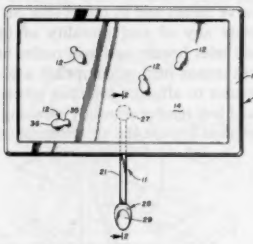


1. A fishing lure comprising a housing, a light emitting diode mounted thereon, an electrical circuit including a source of electromotive potential within the housing, and means for coupling said circuit with said diode for causing a current to flow therethrough to glow said diode, and said circuit comprising a switch in the form of a compression spring adapted to be threaded with the housing onto a fishing line, and said circuit including a pair of spaced contacts disposed in an open-circuit arrangement, and said spring being optionally positionable in bridging closed circuit arrangement with the contacts or displaced from at least one of the contacts in an open circuit arrangement.

4,085,539
PLATFORM TOY

Steven P. Hanson, Bloomington, Minn., assignor to Reynolds W. Guyer, St. Paul, Minn.

Filed Oct. 27, 1976, Ser. No. 736,265
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—1 C 10 Claims



1. An action toy including:

a platform having a resilient sheet member providing a playing surface on the upper side thereof and means for supporting said sheet member from any suitable support with the under side of said sheet member spaced from said support,

manually operated vibrating apparatus for vibrating said sheet member, said vibrating apparatus comprising an elongated resilient member mounted on said platform with its longitudinal axis extending generally in the same direction as said playing surface with a portion thereof extending inwardly beneath said sheet member and a portion projecting outwardly beyond said platform, the inner end of said inwardly extending portion and the outer end of said outwardly extending portion both being free to vibrate,

said resilient member having an impact member adjacent the inner end thereof and positioned to intermittently engage the under side of said sheet member when said resilient member is vibrated and being designed adjacent its outer end for engagement by an extremity of a player so that upon pressure being applied to said outer end and suddenly removed, said outer portion vibrates,

and means for securing said elongated resilient member to said platform in such a manner that when said outer portion of said resilient member is vibrated, the inner portion beneath said sheet member is repeatedly vibrated to cause said impact member repeatedly to engage the under side of said sheet member,

and at least one playing piece designed for being placed upon said playing surface and for movement therealong when said playing surface is vibrated.

4,085,540
MECHANICAL TOY ATHLETE

Hans Ebbe Ingevar Jernstrom, 279 B Rolling Wood L.B.S., Barrington, Ill. 60010, and Thomas Lee Long, 2528 N. Walnut, Arlington Heights, both of Ill. 60004

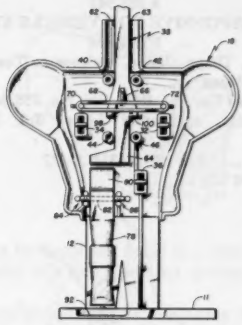
Continuation-in-part of Ser. No. 612,495, Sep. 11, 1975, abandoned. This application Jun. 14, 1976, Ser. No. 695,824
Int. Cl.[2] A63H *13/04*
U.S. Cl. 46—119 21 Claims

1. A mechanical toy, which resembles a human figure, comprising:

a hollow body portion that includes bearing means, which hollow body portion comprises the torso of the human figure;

a lever arm that includes an axle member pivotally mounted in said bearing means to enable rotation of said lever arm from a rest position, into which said lever arm is biased, toward an extended position for propelling a toy projectile and back again, which lever arm resembles in appearance and movement a limb of the human figure;

a slidable plunger mounted in said hollow body portion to enable longitudinal movement of said slidable plunger from a rest position, into which said slidable plunger is biased, toward an extended position by application of an externally supplied force and back again, which slidable plunger cooperates with said lever arm to rotate said lever arm toward its extended position when said slidable plunger is moved toward its extended position;



a striker secured to the top of said slidable plunger; and

keying means for orienting said striker relative to said slidable plunger, wherein said keying means includes:

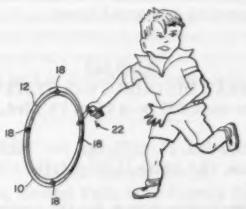
a longitudinal channel in said top end of said slidable plunger;

a square opening in said striker for accepting said slidable plunger, which striker includes a keying flange extending into said square opening for cooperation with said longitudinal channel.

4,085,541
ILLUMINATED HOOP TOY

Calvin R. Mapp, 1125 NW. 88th St., Miami, Fla. 33150

Filed Feb. 4, 1977, Ser. No. 765,843
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—228 5 Claims



1. An illuminatable hoop toy comprising:

a hoop adapted to be rolled along a surface;

an electrically conductive ring embedded in opposed sidewalls of said hoop, each of said rings having an exposed electrically conductive surface on its respective sidewall;

a plurality of spaced bulbs mounted in electrical parallel relationship in said hoop between said conductive rings; and

stick means adapted to contact said exposed conductive surfaces of said rings mounted on said hoop for propelling said hoop along a surface and for illuminating said bulbs in said hoop.

said stick means including an electrical power source with two terminals of opposite polarity,

said stick means having a pair of spaced protruding conductive members,

one of said conductive members electrically connected to one terminal of said power source and the other protruding conductive member electrically connected to the other terminal of said power source,

said pair of protruding conductive members disposed in spaced apart relationship for simultaneous eletrical contact with said exposed conductive surfaces whereby one member electrically engages one said exposed conductive surface and said other member electrically engages said other exposed conductive surface.

4,085,542

SONIC RESPONSIVE TOY VEHICLE STEERING SYSTEM

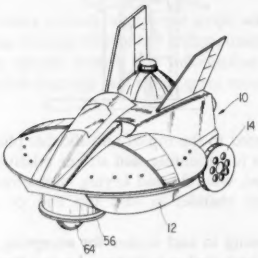
Isao Mitamura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Dec. 30, 1976, Ser. No. 755,863

Claims priority, application Japan, Jul. 30, 1976, 51-102792[U]

Int. Cl.[2] A63H *29/22*

U.S. Cl. 46—256 **9 Claims**



1. A toy vehicle and remote control steering system, comprising a chassis, a single wheel for propelling and guiding said vehicle, means mounting said wheel for rotation about a first axis to propel the vehicle along a surface and for turning about a second axis to steer the vehicle along a surface, propulsion means within said chassis, means operatively connecting said wheel and said propulsion means to rotate said wheel to propel said vehicle, means for sensing sound waves and temporarily connecting said propulsion means and said wheel for turning said wheel to steer said vehicle, and means remote from said vehicle for generating said sound waves.

4,085,543

HEAT DISTRIBUTION SYSTEM

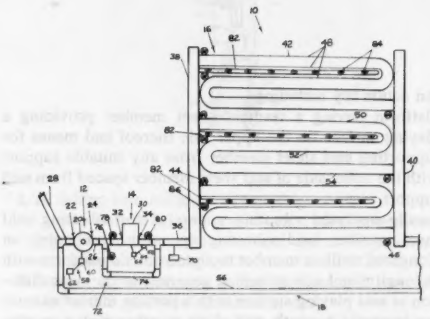
Edwin Ralph Barnard, 305 Boca Ciega Pt. Blvd., St. Petersburg, Fla. 33708

Filed Jan. 27, 1977, Ser. No. 762,834

Int. Cl.[2] A01G *15/00*; E01H *13/00*

U.S. Cl. 47—2 **2 Claims**

1. A heat distribution system for the protection of foliage during periods of low temperature by the conduction of heat from water in close proximity to the foliage, said heat distribution system comprises a water supply means including a pump to supply water to said heat distribution system, a pump inlet means to feed water to said pump, a pump outlet means to feed water from said pump and an automatic control means coupled to said pump to start said pump at a first predetermined air temperature and to stop said pump at a second predetermined air temperature, a network of conduit means including a plurality of primary conduit means disposed in close proximity to the foliage operatively coupled to said water supply means so that water from said water supply means flows through said plurality of primary conduit means wherein heat is transferred by conduction through said plurality of primary conduit means to the foliage and a heater means coupled between said pump means and said network of conduit means to selectively heat the water, said heater means including an automatic temperature control means and heater by-pass means to selectively feed water through said heater means to heat the water at a first predetermined temperature and through said heater by-pass means at a second predetermined temperature, said network of conduit means further comprises an inlet header and an outlet header, each said primary conduit means operatively coupled to said inlet header at one end and said outlet header at the opposite end, each said primary conduit means including an inlet shut off valve means and an outlet shut off valve means to selectively isolate any of said plurality of primary conduit means from said inlet header and said outlet header, said network of conduit means further comprises a plurality of auxiliary conduit means to afford additional protection of foliage during periods of low temperatures by spraying a mist of water near the foliage so as to raise the air temperature in the vicinity



of the foliage, said auxiliary conduit means being operatively coupled to said water supply means so as to receive water therefrom, said auxiliary conduit means including a plurality of nozzle means operatively coupled thereto to spray the water near the foliage, each said auxiliary conduit means including an auxiliary inlet shut off valve means to selectively actuate each said auxiliary conduit means independent of each other and said primary conduit means, each said primary conduit means further comprises a plurality of legs to evenly distribute heat to the ground between said inlet header and said outlet header, said plurality of legs being substantially parallel, said plurality of legs comprises a first leg operatively coupled to said inlet header, a second leg operatively coupled to said first leg and a third leg operatively coupled at one end to said second leg and operatively coupled at the other end to said outlet header.

4,085,544

PLANT SUPPORTING, MOVING AND WATERING APPARATUS

Gordon William Blake, 35 Winders Ave., Tugan, Gold Coast Queensland, Australia (4224)

Filed Jul. 21, 1976, Ser. No. 707,197

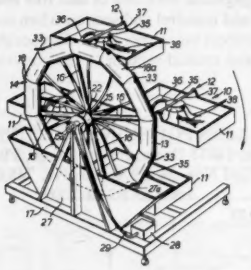
Claims priority, application Australia, Jul. 25, 1975, PC2508

Int. Cl.[2] A47G *7/00*

U.S. Cl. 47—39 **1 Claim**

1. A garden arrangement including a conveyer assembly having mounted thereon a plurality of longitudinally spaced apart mounting means each adapted to support a container for growth material in such manner that each container is maintained in a material-containing attitude, and said conveyer assembly being arranged for movement along a predetermined path whereby the said containers are successively advanced to an accessible location for tending by a gardener, said conveyer assembly being a rotary conveyer rotatable about a horizontal axis and each said mounting means comprising a gimball mounting arrangement for pivotally supporting the respective container in said material-containing attitude, said rotary conveyer being provided with a plurality of circumferentially spaced water containers operatively associated with water

supply means and flow control valve means in such manner that water is maintained only in the said water containers which are disposed at one side of the vertical plane passing through the axis of rotation of said rotary conveyer so as to provide a turning moment about said axis to rotate said conveyer, each said water container being constituted by a segment of the hollow annular rim disposed concentrically about said axis and connected to said rotary conveyer for movement therewith, the dividing wall between each adjacent pair of



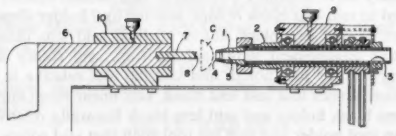
rim-segments including a one-way valve which, when said segments are disposed at said one side, prevents water flowing downwards from one segment to the next whereby each said segment may successively fill with water from a water inlet communicating through an axially disposed gland fitting with said water supply means, and each said segment having a normally closed trip valve means adapted to cooperate with a trip member adjacent the lowermost portion of said rim to open said trip valve means to sequentially spill water from said segments as the latter reach their lower position.

4,085,545

DEVICE FOR THE EXTRACTION OF SUGAR CANE GEMMAS DESTINED TO THERMOTHERAPIC TREATMENT FOR THE CONTROL OF THE BLIGHT OF SUGAR CANE STUMPS LEFT AFTER CUTTING

Wilson Marcelo Da Silva, Piracicaba, Brazil, assignor to Cooperativa Central dos Produtores de Acucar E Alcool do Estado de Sao Paulo, Sao Paulo, Brazil

Filed Oct. 22, 1976, Ser. No. 735,063
Int. Cl.[2] A01G *1/00*
U.S. Cl. 47—58 **5 Claims**



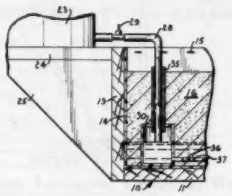
1. Apparatus for cutting the gemma or bud section from a sugar cane culm, comprising a supporting structure, a first bearing member mounted on said supporting structure, a hollow shaft rotatably mounted in said bearing member, a tubular lining in said hollow shaft, a hollow thimble member rigidly secured at one end to one end of said hollow shaft, said thimble member having a principal internal diameter slightly less that that of the tubular lining, and having an internal diameter slightly less than that of the principal diameter at its opposite end, the outside diameter of the thimble member being tapered at said opposite end to form a sharp cutting edge, a second bearing member mounted on said supporting structure in alignment with said first bearing member, a punch member carried by said thrust member coaxially and in alignment with said thimble member, the diameter of said punch member being slightly less than the diameter of the end portion of said thimble member, means for rotating said hollow shaft and thimble member and for moving said thrust member and punch member axially, whereby a culm placed between the punch and the thimble is first pressed against the rotating cutting edge of the thimble and then a section of the culm is cut out and moved into the hollow thimble and tubular lining.

4,085,546

LIQUID SUPPLY SYSTEM FOR GARDENS

James O. Hallar, 126 S. Courtland, Topeka, Kans. 66606

Filed Jun. 14, 1976, Ser. No. 695,599
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—59 **11 Claims**



1. Apparatus for supplying liquid to a plant container that contains material in which plants are grown, said apparatus comprising:

a substantially airtight tank for containing the liquid;

a substantially hollow member removably disposed in the material in the plant container and covered by the material, said hollow member presenting an air chamber interiorly thereof;

a liquid supply tube having an upper end communicating with said tank to receive liquid therefrom and a lower end disposed within said hollow member to supply liquid thereto, said liquid supply tube being arranged to receive air in the lower end thereof for passage to said tank to provide the sole access for air to enter the tank to displace the liquid therein;

at least one outlet in said hollow member for discharging liquid therefrom; and

an air inlet to said air chamber located at a level above the lower end of said liquid supply conduit to provide air which continually fills said chamber above the water level in said hollow member,

whereby liquid from said tank flows through said supply tube and hollow member to the plant container whenever the lower end of said supply tube is above the level of the liquid in the plant container with air passing through said tube to the tank to displace the water which flows out of the tank.

4,085,547

SKATE SHARPENER

John B. Lawson, Central Falls, R.I.; Charles Simpson Cooper, Attleboro, Mass., and Alfred Slocum Vail, Barrington, R.I., assignors to Lawson-Hemphill Inc., Central Falls, R.I.

Filed May 2, 1977, Ser. No. 792,910
Int. Cl.[2] B24B *7/02*
U.S. Cl. 51—47 **7 Claims**

1. A skate sharpener for sharpening an inverted, vertically-clamped skate by moving a grinding wheel supported over said skate in successive strokes across the skate blade, the improvement comprising:

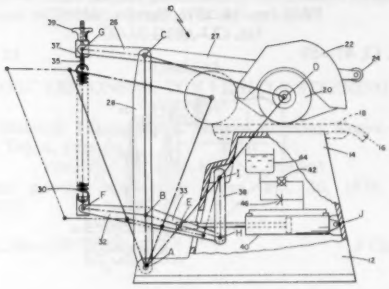
a parallelogram linkage supporting said grinding wheel, said parallelogram linkage including

a vertical arm pivoted at the sharpener base about a base axis,

a support arm supporting said grinding wheel for rotation about a grinding wheel axis and pivotally connected to said vertical arm about a third axis,

a control arm, said control arm parallel with said support

arm and pivotally connected about a fourth axis to said vertical arm, said fourth axis coplanar with said third axis and said base axis, said control arm having a control axis coplanar with said base axis and said grinding wheel axis, said control axis defining with said fourth axis a plane parallel with the plane defined by said grinding wheel axis and said third axis; and



means defining with said vertical arm, said support arm, and said control arm a fourth member of said parallelogram linkage;

said fourth member comprising spring means to partially support the grinding wheel load; and

control means to keep said control axis substantially parallel with the sharpened surface of the skate blade, thereby also keeping said grinding wheel axis substantially parallel with the sharpened surface of the skate blade.

4,085,548

APPARATUS FOR MANUFACTURE OF INSULATION PRODUCTS

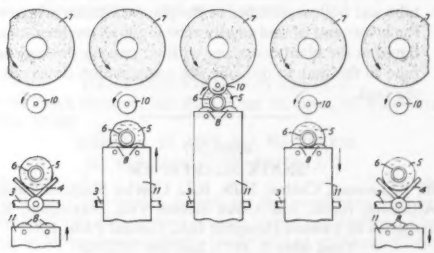
Robert Graham, Chester-le-Street, England, assignor to Newalls Insulation Company Limited, Manchester, England

Filed Feb. 15, 1977, Ser. No. 768,777

Claims priority, application United Kingdom, Feb. 21, 1976, 06899/76

Int. Cl.² B24B 5/32, 21/02

U.S. Cl. 51—103 WH **3 Claims**



1. In an apparatus for manufacturing sections by wrapping fibrous mat around mandrels to form lengths of fibrous, tubular pipe insulation in which the fibers are thereafter bonded by setting a binder in situ in the mat prior to removal of the mandrels, the improvement comprising the provision for an abrasive treatment apparatus which comprises;

conveyor means operable to receive said sections mounted on their respective forming mandrels after setting the binder and to forward said sections on said mandrels to an abrasive treatment station;

abrading means at said station to abrade the outer surface of said sections; and,

means to rotate a section, on its mandrel, in contact with said abrading means whilst maintaining a controlled spacing between the mandrel and the abrading means wherein each mandrel is longer than a section mounted thereon and has a free end portion projecting axially from each end of said section, said apparatus having transfer means comprising lifting members engageable with said free end portions and displaceable relative to the direction of travel of the conveyor means so as to lift said mandrel from the conveyor means to present a section thereon to the abrading means, the transfer means further comprising a drive means engageable with one of said free ends and operable to rotate said mandrel and section when so presented, said lifting members being thereafter displaceable to return the mandrel and treated section to the conveyor means.

4,085,549

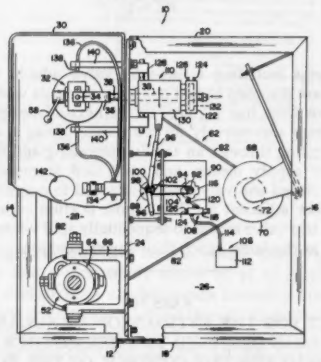
LENS POLISHING MACHINE

Lee R. Hodges, 14073 Passage Way, Largo, Fla. 33540

Filed Nov. 26, 1976, Ser. No. 745,073

Int. Cl.² B24B 7/00

U.S. Cl. 51—119 **8 Claims**

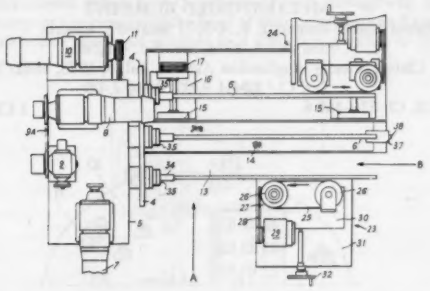


1. A high speed lens polishing machine comprising a cabinet having a polishing element mounted thereon, said polishing element including a spindle and lap tool holder configured to retain a lap tool thereon, a rotary drive attached to said cabinet operatively coupled to said polishing element, a lens blank holder attached to said cabinet, said lens blank holder configured to retain a lens blank thereon, a linear drive including a secondary drive assembly attached to said cabinet operatively coupled to said lens blank holder, said lap tool holder disposed relative to said lens blank holder to hold said lens blank in operative engagement with said lap tool, said rotary drive rotating said lap tool holder and said lap tool relative to said lens blank holder and said lens blank, said linear drive moving said lens blank holder and said lens blank linearally relative to said lap tool holder and said lap tool such that said rotary and linear motion are independent of each other during the polishing process, said linear drive comprising a lateral drive to move said lens blank holder and said lens blank laterally relative to said lap tool holder and said lap tool during the polishing process and a longitudinal drive comprising a fluid drive means, control means operable between a first and second position operatively coupled to said secondary drive assembly and said fluid drive means and an actuator means movable between a first and second position operatively coupled to said control means, said actuator means coupled to said lens blank holder such that as said control means moves from said first position to said second position said actuator means moves from said first position to said second position and as said control means moves from said second position to said first position said actuator means moves from said second position to said first position to move said lens blank holder and said lens blank longitudinally relative to said lap tool holder and said lap tool during the polishing process.

4,085,550
APPARATUS FOR ABRASIVELY TREATING INSULATION PRODUCTS

Robert Graham, Chester-le-Street, England, assignor to Newalls Insulation Company Limited, Manchester, England

Filed Feb. 15, 1977, Ser. No. 768,789
Claims priority, application United Kingdom, Feb. 21, 1976, 06898/76
Int. Cl.[2] B24B *21/02*
U.S. Cl. 51—145 T 14 Claims

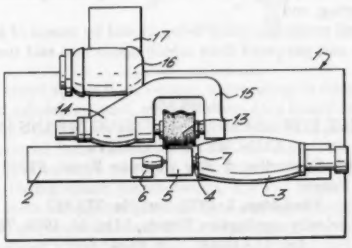


1. Apparatus for applying an abrasive treatment to the outer surface of a section comprising a length of bonded fibrous tubular pipe insulation, said apparatus comprising, a support, a mandrel rotatably mounted thereon for receiving a section to be treated, abrading means which comprises an endless, abrasive-coated belt and means for re-circulating said belt, in use, through a sensibly flat path parallel to the longitudinal axis of said mandrel with at least the length of a section presented to said flat path, the direction of travel of the belt in said flat path being selected whereby the section is urged onto the mandrel whilst presented to the abrading means at an abrasive treatment station, means for effecting relative displacement between the mandrel and the abrasive treatment station so as to present the outer surface of a section on said mandrel to the abrasive treatment station for abrasive treatment by the abrading means thereat, together with means for rotating the section whilst so presented.

4,085,551
GRINDING MACHINES

Maurice Miller Ward, April Cottage, Ringwood Road, Ferndown, Dorset, England

Filed Aug. 5, 1976, Ser. No. 711,786
Claims priority, application United Kingdom, Aug. 8, 1975, 33232/75
Int. Cl.[2] B24B *49/16*
U.S. Cl. 51—165 R 11 Claims

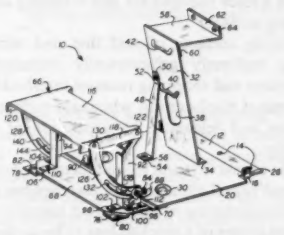


1. A grinding machine comprising:
means for mounting a grinding tool;
means for driving a grinding tool installed on said mounting means;
spindle means for supporting a workpiece to be ground, said spindle means defining an axis about which a workpiece may be rotated;
means for rotating said spindle means about its axis, said spindle means rotating means including means for automatically limiting to a predetermined value the torque exerted on said spindle means during rotation; and
means for effecting relative linear movement between said grinding wheel mounting means and said spindle means so as to bring a grinding tool on said mounting means into contact with a rotating workpiece on said spindle means.

4,085,552
WORK TOOL STAND

James H. Horine, Lexington; Lowell K. Watts; Hershel R. Wininger, both of Richmond; Dale Kelley, London, and Charles L. Sears, Somerset, all of Ky., assignors to Irvin Industries, Inc., Stamford, Conn.

Filed Mar. 11, 1977, Ser. No. 776,703
Int. Cl.[2] B24B *41/00*
U.S. Cl. 51—166 R 11 Claims



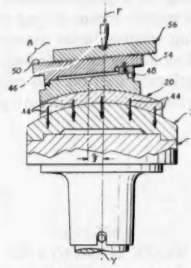
1. A stand for selectively supporting a work tool in either one of two positions, said stand comprising:
(a) a fixed plate;
(b) a support plate having one edge pivotally connected to said fixed plate and disposed for movement from a first position wherein said support plate lies in a plane substantially parallel to the plane of said fixed plate, to a second position wherein said support plate lies in a plane intersecting the plane of said fixed plate;
(c) a bracket mounted on said support plate and extending upwardly therefrom when said plate is in its first position, said bracket having clasp means adapted to mount the work tool thereon and permit movement of said tool conjointly with movement of said plate;
(d) said bracket further having a leg projecting outwardly therefrom when said support plate is in its first position, said leg being located in spaced relation to said support plate;
(e) said fixed plate and said support plate constituting adjacent supports of said stand when said support plate is in its first position; and
(f) said fixed plate and said leg constituting spaced supports of said stand when said support plate is in its second position; and
(g) a work support platform detachably connected to a second edge of said support plate;
whereby the work tool is supported in a first position when said support plate is in its first position and said work tool is supported in a second position when said support plate is in its second position.

4,085,553

LENS SURFACING ADAPTOR

Louis Prunier, Oxford, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Mar. 21, 1977, Ser. No. 779,655
Int. Cl.[2] B24B *13/00*
U.S. Cl. 51—216 LP **10 Claims**



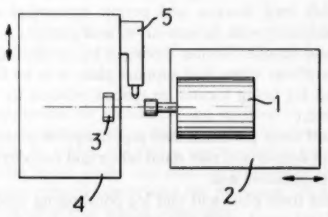
1. A lens surfacing adaptor for blocked lenses comprising:
a first member on one side having means to detachably fit upon a block used to support a lens for surfacing and an opposite coupling surface;
a second member on one side having means to centrally receive a force required for lens surfacing and an opposite coupling surface;
said coupling surfaces of said first and second members having uniformly geometrically patterned interfitting protrusions and receiving recesses interlocking said members against displacement when said surfaces are brought together and releasable by separation of said surfaces; whereby
separation of said first and second members permits selective universal lateral adjustment of one member relative to the other for centering of said second member over the geometrical center of a blocked lens to be surfaced and bringing said members together locks said members in place for applying said surfacing force geometrically centrally against said lens during a surfacing operation.

4,085,554

METHOD TO DRESS A GRINDING WHEEL

Terumitsu Sugita, Narashino, Japan, assignor to Seiko-Seiki Kabushiki Kaisha, Japan

Filed Nov. 9, 1976, Ser. No. 739,854
Claims priority, application Japan, Nov. 11, 1975, 50-135552
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—325 **4 Claims**



1. A method of dressing a grinding wheel, comprising:
positioning a dressing tool relative to a grinding wheel for dressing the same;
repeatedly traversing the dressing tool across the grinding wheel;
measuring a force developed between the dressing tool and the grinding wheel during each traverse of the dressing tool across the grinding wheel;
determining from the forces measured during each traverse of the dressing tool when the grinding wheel has been sufficiently dressed; and
terminating traversing of the dressing tool across the grinding wheel to complete the dressing operation when said measured force reaches a predetermined value so that the grinding wheel has been sufficienctly dressed.

4,085,555

MULTI-STORIED BUILDING

Harald Mann, Rainerstr. 5, A-5021 Salzburg, Austria

Filed Jul. 3, 1974, Ser. No. 485,583
Claims priority, application Austria, Jul. 3, 1973, 5862/73
Int. Cl.[2] E04H *9/00, 9/04, 1/00*
U.S. Cl. 52—169.6 **1 Claim**

1. A multi-storied residential building adapted for protection against bombs and radiation, said building comprising:
a plurality of stories having ceilings supported by a supporting framework, each of said stories having permanent living quarters;
a front wall having windows communicating with said living quarters;
an earth covering extending over the ceiling of the top of said stories and over all of the walls of said building except said front wall, said earth covering thus covering all of said stories, said earth covering extending downwardly and outwardly from the cover of said top story to a natural ground level and thus forming a naturally-sloping hill;
at least one protective room on each of said stories, each protective room being enclosed by shielded and radiation proof concrete walls;
said window-containing front wall projecting from the slope of said hill, and said protective rooms extending into said hill;
exits communicating with each of said stories and extending through said earth covering to open onto the slope of said hill;
a wall located in front of said wall of windows, said wall having on each story thereof loggia-like recesses fitted with preferably radiation proof roller blinds, hinged curtains or the like;
each of said exits from each of said stories comprising a substantially horizontal tunnel leading through said earth covering; and
each said protective room being closed by means of a radiation- and gas-proof door which opens into said tunnel.

4,085,556

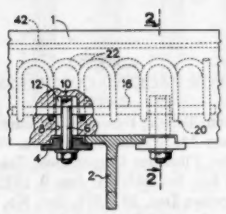
DEVICE FOR ANCHORING FIXING MEANS IN A CONCRETE ELEMENT

Roger Paul Sonneville, 5 Rue Maurice Ravel, 92210 Saint-Cloud, France

Filed Mar. 2, 1977, Ser. No. 773,557
Claims priority, application France, Mar. 24, 1976, 76 08530
Int. Cl.[2] E04B *1/38;* **E04C** *3/10*
U.S. Cl. 52—223 R **11 Claims**

1. An assembly comprising a concrete element having an outer face, a structure to be clamped against said outer face,

and a device for clamping said structure to said outer face and comprising at least two substantially T-shaped fixing means having a head and located in a plane and on opposite sides of said structure, the concrete element comprising, for each fixing means, a passageway in the element and opening onto the outer face of the element, a cavity in the element and allowing the rotation of the head of the corresponding fixing means through 90° and extending the passageway, a longitudinal reinforcement having a longitudinal axis which is substantially parallel to the outer face and substantially parallel to said plane and located at a short distance from the outer face of the concrete element and near to an inner end of the passageways, the reinforcement defining, in the region of each passageway, an opening for the passage of the head of the corresponding fixing means when said head extends in a direction parallel to the



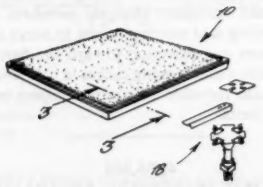
longitudinal axis of the reinforcement and the reinforcement defining surfaces for engaging and retaining the heads of the fixing means adjacent said openings for retaining the heads when they are perpendicular to said longitudinal axis of the reinforcement, and arch-shaped members which are fixed to a surface of the reinforcement adjacent the outer face of the concrete element and have inclined branches which extend into the concrete in a direction opposed to said outer face to a sufficient depth and arranged substantially symmetrically relative to said longitudinal axis to distribute the forces within the concrete element, the fixing means having, in a region of the fixing means remote from said head, means defining surfaces which are in bearing relation to said structure and to said outer face of said element for retaining said structure against said outer face of the element.

4,085,557

RAISED ACCESS FLOOR SYSTEM

James A. Tharp, P.O. Box 10816, Dallas, Tex. 75207, assignor to James A. Tharp, Dallas, Tex.

Filed Jun. 1, 1976, Ser. No. 691,839
Int. Cl.² E04F *15/024*
U.S. Cl. 52—263 **3 Claims**



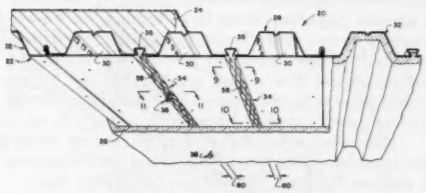
1. A raised access floor system, comprising, in combination, a pan of galvanized steel, a high density chip board core material placed inside said pan, the sides of both said pan and said core material both flaring upwardly outward with said pan flaring greater than said core material, thus forming an upwardly flaring space therebetween, a PVC impact molding resting upon an upper edge of said pan and upon an upper edge of said core material, said PVC impact molding forming a frame around a central opening, an inner edge of said molding including an inwardly extending flange and an angularly inclined side wall to form an acute corner, a galvanized steel sheet in said central opening resting on said flange, and a carpet placed upon said galvanized sheet, the edges of said carpet extending into said acute corner along said inner edge of said PVC impact molding, and a downward extending fin integral with an underside of said PVC impact molding extending into said space between said pan and the sides of said core material, said fin being downwardly tapered in thickness and outwardly bowed, so a mid-portion thereof abuts with said pan side while a lower edge thereof abuts with said core material, said core material having a density between 44 and 47 pounds per cubic foot, and said raised access floor panel including a substructure for support thereof elevated above a building floor.

4,085,558

METAL CELLULAR DECKING SECTION AND METHOD OF FABRICATING THE SAME

Raymond E. Albrecht, Sewickley, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 696,517, Jun. 16, 1976, abandoned. This application Jun. 8, 1977, Ser. No. 804,735
Int. Cl.² E04F *12/04*; E04B *5/23*
U.S. Cl. 52—451 **20 Claims**



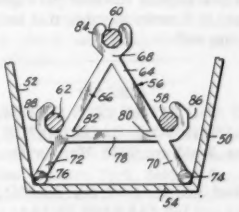
1. A metal cellular decking section comprising:
an integral corrugated upper metal sheet presenting plural crests and plural valleys and webs connecting adjacent ones of said crests and said valleys;
a correlative lower metal sheet secured to said upper metal sheet along contiguous portions thereof and cooperating therewith to define parallel enclosed cells; and
said lower metal sheet having at least one expanded metal zone formed integrally therein and extending longitudinally of said decking section beneath one of said valleys.

4,085,559

HOG SLAT REINFORCING BAR SUPPORT

Robert J. Ilukowicz, Coram, N.Y., assignor to Preco Industries, Ltd., Plainview, N.Y.

Continuation-in-part of Ser. No. 625,635, Oct. 24, 1975, Pat. No. 4,007,572. This application Jul. 23, 1976, Ser. No. 708,122
Int. Cl.² E04C *5/16*; E04G *17/06*
U.S. Cl. 52—687 **10 Claims**



1. In combination: a concrete form of inverted trapezoidal cross-section including a bottom wall and side walls connected thereto, a plurality of parallel reinforcing rods in said form and at least one monolithic plastic reinforcing rod support holding said rods in position in said form, said support including an A-shaped frame and support portions on said frame for elastically receiving and retaining said reinforcing rods, at least one

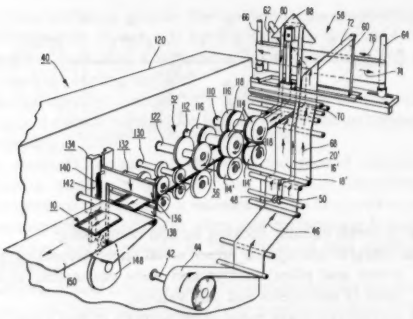
of the support portions being located at a higher level in the form than a second and third of the support portions, said one support portion opening directly upwards and said second and third support portions opening obliquely upwards, said frame including laterally extending portions in the form of diverging legs forming an inverted V and engaging against said walls and being adapted for being urged against the side walls by the weight of the reinforcing rods in said support portions, said frame including a cross-bar extending between said legs and including ends at which said second and third support portions are respectively positioned.

4,085,560

APPARATUS AND METHOD OF FORMING COVERS FOR FLEXIBLE COMMODITY-CONTAINING PACKAGES

Robert B. McClosky, Hope, N.J., assignor to Wrap-ade Machine Company, Inc., Clifton, N.J.

Filed Oct. 27, 1976, Ser. No. 736,103
Int. Cl.[2] B65B *41/18, 51/16, 9/02*
U.S. Cl. 53—27 **39 Claims**



1. A method of continuously forming covers connected to flexible commodity-containing packages, said method comprising the steps of:

a. continuously directing at least two webs into overlying relationship with each other;

b. feeding flexible commodity-containing packages between the overlying webs with a margin of the packages being superimposed with a margin of each of the overlying webs;

c. applying pressure to the superimposed margins of the overlying webs and flexible packages to join together the packages and webs at the superimposed margins to form a composite; and

d. severing the composite in discrete, spaced-apart sections to form a plurality of discrete packages, each package being joined to a cover member that includes sections of the overlying webs.

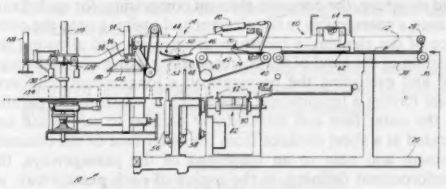
4,085,561

METHOD AND APPARATUS FOR DEPOSITING PACKAGES OF SOFT-PACK GOODS IN A BOX

Marless Wayne Waldrop, 9933 Harwin Dr., Houston, Tex. 77036

Filed Jan. 21, 1977, Ser. No. 761,211
Int. Cl.[2] B65B *35/58*
U.S. Cl. 53—35 **9 Claims**

1. A method for depositing packages of soft packed goods in a box, comprising the steps of moving the packages facing up or down, singly receiving successive ones of the packages on a support means, alternately rotating said support means approximately 180° in opposite rotative directions when successive packages are received thereon so as to invert and permit alternate ones of said packages to fall onto two respective stack sites in the box, and continuing to singly receive successive ones of the packages on the support means and alternately



rotating support means in opposite directions in order to invert and stack additional packages one above the other at each stack site.

4,085,562

APPARATUS FOR PACKING COMPRESSIBLE FIBROUS BATTS

Lawrence R. Finn, Toledo; Daniel A. McCartan, Heath, both of Ohio, and Gary M. Schmandt, Bellevue, Wash., assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 585,161, Jun. 9, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,370
Int. Cl.[2] B65B *57/10, 63/04*
U.S. Cl. 53—59 R **15 Claims**

1. Apparatus for producing a package of compressed fibrous batts comprising means for forming an elongate compressible layer of randomly-disposed fibers held together by a binder, means for severing said layer into batts of determinate lengths, packaging apparatus for forming the batts into a compressed, spiral configuration, and means for retaining said batts and for moving said batts in end-to-end relationship to said packaging apparatus, said last-named means comprising a conveyor, a plurality of movable elongate members disposed along one side of said conveyor, means for moving said elongate members horizontally to engage the batts, a plurality of stationary elongate members located along the side of said conveyor opposite said movable elongate members, said batts being retained when said movable elongate members engage the batts and move them against said stationary elongate members, and control means for actuating said moving means to move said movable elongate members in a direction toward the batts and for sequentially actuating said moving means in a downstream direction to move said movable elongate members in a direction away from the batts.

4,085,563

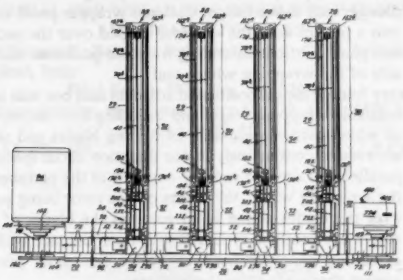
COOKIE DISPENSING APPARATUS

Walter W. Egee, Wallingford, Pa., and Clarence W. Cramer, Burlington, N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Jan. 31, 1977, Ser. No. 764,190
Int. Cl.[2] B65B *57/10, 35/44*
U.S. Cl. 53—59 R **23 Claims**

1. Cookie dispensing apparatus for dispensing stacks of cookies into the pockets of cookie packaging trays comprising a tray conveyor assembly including a tray conveyor belt successively advancing spaced multi-pocketed cookie trays thereon, drive means for intermittently driving said tray conveyor belt, at least one cookie delivery assembly associated with said tray conveyor assembly, said cookie delivery assem-

bly comprising a cookie delivery line and a dispenser assembly, said cookie delivery line being adapted to deliver cookies to said dispenser assembly, said dispenser assembly being disposed above said tray conveyor belt and including a stacking chamber for receiving cookies from said cookie delivery line, and a gate selectively movable to discharge a stack of cookies from said stacking chamber, gate actuating means for controlling movement of said gate, said cookie delivery line comprising a shingler assembly for receiving an array of edge-supported face-abutting cookies and tilting said cookies into a shingled attitude, and a separator assembly for receiving cookies from said shingler assembly and delivering them individually in spaced relation to said dispenser assembly, said apparatus including control means for controlling the delivery of cookies from said cookie delivery line to said dispenser assembly and from said dispenser assembly to said conveyed trays.

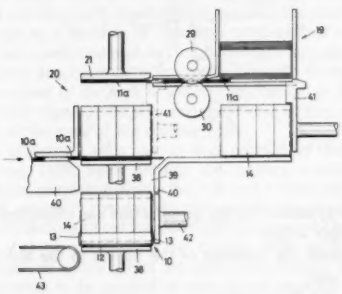


4,085,564

METHOD AND APPARATUS FOR MAKING TRAY-TYPE PACKETS

Heinz Focke, Verden, Aller, Germany, assignor to Focke & Pfuhl, Verden, Aller, Germany

Filed Aug. 13, 1975, Ser. No. 604,283
Claims priority, application Germany, Aug. 27, 1974, 2440885
Int. Cl.² B65B *11/08, 11/50*
U.S. Cl. 53—32 **8 Claims**



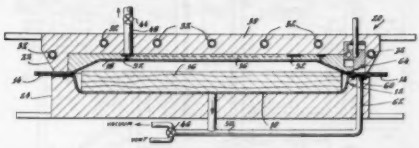
1. A method of making tray packets with a cover flap which encloses the material in the packet in a U-shape and whose side webs engage a bottom part formed with vertical side walls, comprising the steps of: forming from a flat blank a cover flap which has maximum dimensions for the height of the side webs in accordance with the dimensions in height of the material in the packet, resulting from detected dimensions; cutting the excess lengths of the side webs such that the side webs are fixed at a distance above the material resting on a blank forming the bottom part; folding the side webs laterally in the direction of the material; lowering the resulting U-shaped cover flap on to the material and further lowering the cover flap and the material together with a blank forming the bottom part and having parts projecting from the material such that by moving the blank relative to stationary folding walls, projecting parts thereof are folded upwards to form the side walls of the bottom part that engage the side webs.

4,085,565

PACKAGING APPARATUS FOR FORMING SPECIALLY SHAPED PACKAGES

Reid A. Mahaffy, Montclair; Joseph M. Psota, Hawthorne, and John A. Giordano, West Paterson, all of N.J., assignors to Mahaffy & Harder Engineering Co., Totowa, N.J.

Filed Dec. 8, 1976, Ser. No. 748,650
Int. Cl.² B65B *31/02*
U.S. Cl. 53—112 A **5 Claims**



1. In vacuum packaging apparatus of the type wherein upper and lower continuous webs of plastic packaging material are transported past packaging stations where various operations are performed, and wherein the lower web is formed into receptacles with surrounding flanges, said receptacles being loaded with product and the top web thereafter being laid over the lower web to be sealed thereto to form vacuum packages;

apparatus for making crowned packages comprising:

evacuation-and-seal means having relatively reciprocable upper and lower means to surround the package and providing spaces above and below said package;

said evacuation-and-seal means including means to evacuate said spaces and said package;

said evacuation-and-seal means further including first heated means to seal said two webs together to make an hermetically-sealed package;

said upper means including means providing an enclosed region having a top surface located at a substantial vertical height above the line where said two webs are located and configured to accommodate movement of said product together with the top web upwards into said region;

said upper means further including second heated means at said top surface above the top web presenting a heated surface to said top web;

means operable during evacuation of said package to stretch the top web up said substantial vertical height to a position adjacent said heated surface to transfer heat to said top web to heat it to an elevated temperature providing for forming thereof; and

means to selectively sequentially vent said upper and lower spaces to provide for shifting of said product to a final position in which a portion of the product and the top web is above said flanges, thereby to produce a crowned effect.

4,085,566

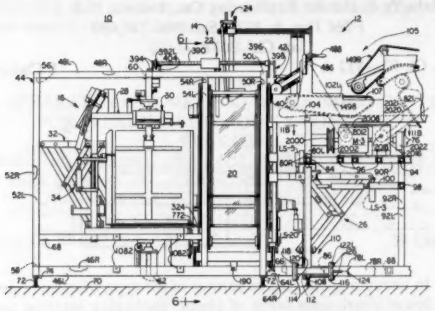
MACHINE FOR STACKING AND CASING ARTICLES

Norman P. Crowe, Miami Township, Clermont County, and Joseph M. Lohse, Terrace Park, both of Ohio, assignors to Multifold-International, Inc., Milford, Ohio

Filed Mar. 16, 1977, Ser. No. 778,129
Int. Cl.² B65B *63/02, 57/10, 35/50*
U.S. Cl. 53—124 D **19 Claims**

1. A machine for arranging flat articles in a stack which comprises means for delivering articles to a stack forming station, endless flight supports mounted on opposite sides of the stack forming station, opposed flights mounted on the flight supports for supporting a stack of the articles therebetween, stack support means below the stack forming station,

means for lowering the flights as the stack builds up thereon until a complete stack has been formed and for lowering the complete stack onto the stack support means, the flights passing the stack support means to return to the stack forming station, means for advancing the complete stack from the stack support means as the flights return, a table, a rug mounted on the table with a pile face of the rug exposed and aligned with the stack support means, the stack advancing means advancing



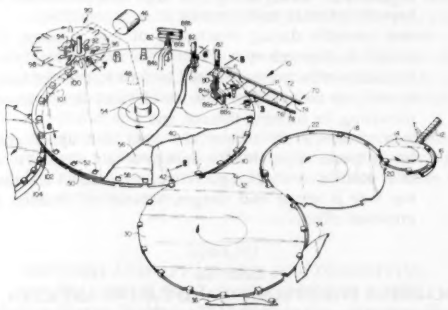
the stack from the stack support means onto the pile face of the rug, side guides, side guide supports above the side guides for supporting the side guides substantially parallel to and on opposite sides of the path of stack advance from the stack support means, resilient means connecting the side guide supports to the side guides to resiliently support the side guides, and means releasably clamping lower edge portions of the side guides against the pile face of the rug on opposite sides of the path of stack advance.

4,085,567

HIGH SPEED WRAPPING MACHINE WITH ROTARY FOLDER

Roger L. Putnam, Jr., East Longmeadow; Richard H. Provost, Brimfield, and Alfred D'Antonio, East Longmeadow, all of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Jun. 24, 1976, Ser. No. 699,518
Int. Cl.[2] B65B *11/28*
U.S. Cl. 53—225 **18 Claims**



1. A high speed wrapping machine for individually wrapping tablet-like products comprising:

a rotatable wrapping wheel having a plurality of product-receiving pockets distributed about the periphery of the wheel for receiving the products at one point on the periphery and discharging at another point and continuously moving the products between said points as the wrapping operation is carried out;

a set of plungers associated respectively with each of the peripheral pockets and disposed for revolving movement with the respective pockets at opposite axial sides of the wheel to plunge the products in the axial direction in and out of the pockets as the wrapping wheel rotates;

wrapper feeding means having a feed path for delivering individual wrapper panels to one axial side of the wheel between a respective pocket and one of the plungers;

product feeding means for delivering individual products adjacent said one axial side of the wheel between an individual wrapper panel and one of the plungers whereby the plunger may move the product and wrapper panel axially into a pocket with the wrapper draped over the product and panel portions extending from the pocket at said one side of the wrapping wheel; and

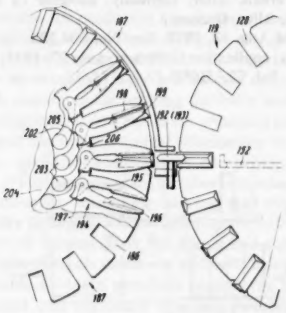
rotary folding means positioned adjacent said one side of the rotatable wrapping wheel and including two rotors, each of which carries a plurality of folding blades and which are rotated continuously in one direction about spaced = parallel axes situated radially outward of the periphery of the wrapping wheel, the blades of one rotor being passed over the blades of the other rotor as the blades of both rotors are brought synchronously into contact with the extending panel portions to flatten the panel portions against the products in the pockets.

4,085,568

FOLDABLE BLANKS FOR MAKING PACKETS FOR ROD-SHAPED ARTICLES

Heinz Focke, and Kurt Liedtke, both of Verden, Aller, Germany, assignors to Focke & Pfuhl, Verden, Aller, Germany

Filed Apr. 21, 1975, Ser. No. 570,152
Claims priority, application Germany, Apr. 23, 1974, 2419437; Aug. 16, 1974, 2439192
Int. Cl.[2] B65B *11/32*
U.S. Cl. 53—234 **12 Claims**



1. In an apparatus for the manufacture and closure of packets from a blank which

(a) encloses the contents of the packet in the manner of a hose and

(b) has end flaps which

(i) project from two opposite faces and

(ii) can be connected together by pressing them together,

said apparatus comprising a first turret having pockets for receiving the packets, the improvement comprising a plurality of pairs of closing tongs individually mounted on said first turret adjacent to each of said pockets, each of said closing tong pairs comprising two tong arms relatively pivotable with respect to each other about a common axis, said tong arms being shaped and positioned to press together the end flaps on a packet positioned in the associated pocket with its end flaps projecting from the pocket, one tong arm of each pair including a pivot arm extending beyond said axis and terminating in cam follower means, and a first toothed segment, the other tong arm of each pair including a second toothed segment in engagement with an adjacent first toothed segment, and a cam

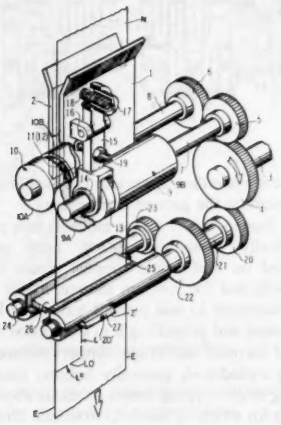
dis mounted proximate said first turret, in engagement with said cam follower means, and shaped to control said closing tongs, whereby the successive pivoting movement of each of said one tong arms is transmitted to an adjacent one of said other tong arms via said first and second toothed segments.

4,085,569

DEVICE FOR PREPARING PIECES OF WRAPPING MATERIAL FOR USE AS THE INNER WRAP IN HINGE LID CIGARETTE PACKS

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Sep. 3, 1976, Ser. No. 720,430
Claims priority, application Italy, Apr. 29, 1974, 3370 A/74
Int. Cl.[2] B65B *41/16*
U.S. Cl. 53—389 **9 Claims**



1. In a machine for producing inner wrappers for hinge-lid packets of cigarettes, the combination of;

a pair of driving rolls having axes parallel to one another the rolls being disposed to engage mutually opposite surfaces of a continuous web of flexible material for making inner wrappers of batches of cigarettes to be packed in packets of cardboard material having hinge-lids; means for rotating the driving rolls in mutually opposite directions for movement of the web in a direction parallel to longitudinal side edges of the web and transverse of the cigarettes, and of the axes of the driving rolls;

a pair of cutting rolls having axes parallel to those of the driving rolls, each cutting roll having cutting means thereon extending along the roll and transversely of the web; means for rotating the cutting rolls in mutually opposite directions to cut longitudinally successive sheets from the web on rotation of the cutting rolls, each sheet to provide an entire one of the inner wrappers for a batch of cigarettes to be packed in one of the packets having a hinge-lid;

a scoring disk coaxial with one of the driving rolls, rotatable therewith by the means for rotating it and having scoring edge portions for scoring a line of sheet-weakening indentations, parallel to the longitudinal side edges of the web and to the direction of the movement of the web, in each of the sheets, the scored edge portions being spaced apart to leave, in the line of sheet-weakening indentations, sheet portions linking the removable part with the remainder of the wrapper and disposed at corners of the wrapper; and

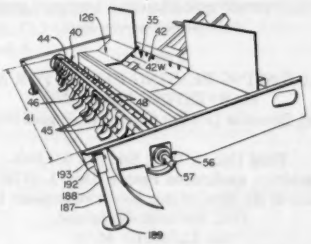
a back-up roller, generally coaxially disposed relative to the other one, of the pair of driving rolls opposite the scoring disk, to thereby provide an end part of each inner wrapper extending transversely of the cigarettes adjacent one end thereof and readily removable from the entire inner wrapper by applying a tractive force to the end part when the hinge-lid of the packet has been opened, for manual breaking of the wrapper along the line of sheet-weakening indentations.

4,085,570

FORAGE HARVESTER AND ATTACHMENT THEREFOR

Marvin L. Joray, Celina; Warner M. Heckley, Rockford, and Lyman J. Gunyou, Celina, all of Ohio, assignors to Avco Corporation, Coldwater, Ohio

Filed Apr. 8, 1976, Ser. No. 675,184
Int. Cl.[2] A01D *45/00*
U.S. Cl. 56—2 **23 Claims**



1. In combination, a mobile agricultural machine adapted to traverse ground for cutting, conditioning and moving a crop to a crop transfer zone within said machine and then directly away from said zone, and a chopper adapted to trail said machine, said machine having:

flail means for cutting and conditioning standing crop in one mode of operation and for picking up a pre-cut ground swath of a crop in another mode of operation,

said machine having means for gathering crop and moving crop from the flail means to the transfer zone, and

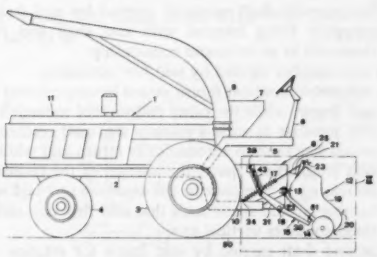
said machine having means for selectively moving crop directly from said transfer zone toward said chopper and toward the ground.

4,085,571

RESILIENT MOUNTING FOR AGRICULTURAL MACHINERY ATTACHMENT

Frans H. Mortier, Maldegem, and Frans Degraeve, Zedelgem, both of Belgium, assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Apr. 21, 1976, Ser. No. 678,839
Claims priority, application United Kingdom, May 2, 1975, 18318/75
Int. Cl.[2] A01D *67/00*
U.S. Cl. 56—208 **14 Claims**



1. An agricultural machine adapted to move in a field and process field crops, comprising:

a base structure,

an attachment extending from one end of the base structure

for receiving crop material from the field and for conveying it to the base structure,

pivot means on said one end of the base structure for pivotally mounting the attachment thereon, the attachment being movable between operative and transport positions,

resilient means attached at one end to the attachment at a location above the pivot means and at the other end to the base structure for resiliently compensating the weight of the attachment and for floatingly maintaining the attachment in contact with the ground contour when in an operative position, and,

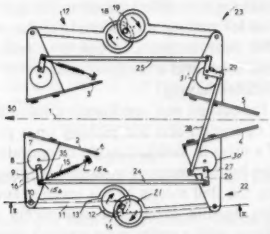
independent lifting means pivotally mounted on the base structure at said one end and below the pivot means and reaching beneath the attachment for lifting the attachment from the operative position to a transport position.

4,085,572

SELF-ADJUSTING BEATING DEVICE FOR A GRAPE HARVESTING MACHINE

Alain Bruel, Domaine Le Petit Chaumont, Eigues Mortes, Gare, France

Filed Dec. 2, 1975, Ser. No. 637,040
Claims priority, application France, Dec. 2, 1974, 74 40716
The portion of the term of this patent subsequent to Jun. 24, 1992, has been disclaimed.
Int. Cl.[2] A01D *46/00*
U.S. Cl. 56—330 **9 Claims**



1. A beating device for a grape harvesting machine for the harvesting of grapes from a row of grapevines, said beating device comprising:

a frame;

a pair of beaters mounted on said frame in opposing relationship to define thereinbetween a longitudinal space for the passage of said row of grapevines, each of said beaters comprising:

a plurality of vertically spaced, horizontally disposed whips;

a pivotally mounted lever, said whips being carried at one end of said lever;

a first eccentric, said eccentric being carried by said lever at a point inwardly spaced from said whips, said lever being pivotable about the center of said first eccentric;

a first vertical shaft rotatably carried by said frame, said eccentric being integral with said shaft and rotatable therewith in an eccentric relationship;

an arm member carried by said first eccentric;

an adjustable, resilient return means having one end fixed to said frame, while the other end thereof is carried by said arm member in such a manner that said resilient return means functions to automatically return said whip toward said longitudinal space, the amount of the resilient force increasing in response to the resistance to said whip returning to said space such that said first eccentric is rotated about its vertical axis;

a second shaft carried by said frame for rotation about a second vertical axis;

a second eccentric driven by said second shaft;

a connecting rod having one end connected to said second eccentric and the other end connected to an end of said lever opposite said whip-carrying end of said lever; and

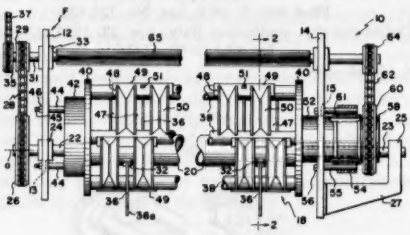
means for rotating said second shaft about said vertical axis.

4,085,573

FARM CROP PICK-UP APPARATUS

Preston Marsh, Rte. 1, Hope, Mich. 48628

Filed Apr. 8, 1976, Ser. No. 674,955
Int. Cl.[2] A01D *89/00*
U.S. Cl. 56—364 **14 Claims**



1. Farm crop handling apparatus for handling severed farm crop deposited on the ground comprising:

portable frame support means movable in a path of travel;

longitudinally extending, rotary, crop pick-up means mounted on said frame support means for movement therewith and for rotation thereon about a longitudinal axis, transverse to said path of travel, for lifting crop off the ground and propelling it in a direction opposite to the path of travel of said frame support means;

generally cylindrical, generally hollow, longitudinally extending crop stripping means rotatable about its longitudinal axis for stripping the crop from said crop lifting means when said crop pick-up means and said crop stripping means are rotated;

said crop stripping means including a plurality of longitudinally spaced openings;

said crop pick-up means including support means disposed interiorly of said stripping means, and a plurality of radially outwardly extending, circumferentially and longitudinally spaced pick-up tines on said support means successively movable in said openings between radially outer positions to pick-up crop and radially inner positions to deposit the picked up crop on said crop stripping means as said crop pick-up means and crop stripping means are rotated;

means for rotatably driving said crop pick-up means and said stripping means in timed relation including:

a first drive means coupled to one end of said pick-up means for rotatably driving said pick-up means about its axis; and

a second drive means, independent of said first drive means, coupled to said stripping means adjacent the opposite end of said pick-up means for rotatably driving said stripping means in timed relation with rotation of said pick-up means;

axially extending annular mount means on one end of said stripping means adjacent said opposite end of said pick-up means;

said frame support means including a first axially extending opening therethrough receiving said annular mount means;

said stripping means being disposed on one axial side of said opening;

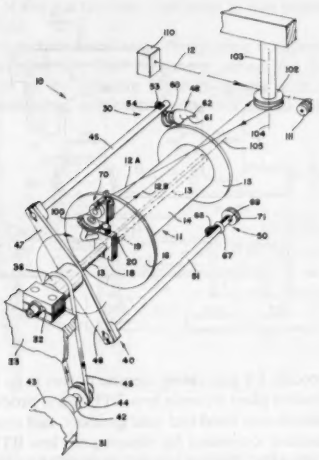
said annular mount means including a drive portion on the axially opposite side of said opening coupled to said second drive means.

4,085,574

APPARATUS FOR AUTOMATICALLY ANCHORING, TWISTING AND WINDING FILAMENT, OR THE LIKE, ONTO A SPOOL

Philippe Hardy-Thé McLain, Columbia, and Bob Gene Shepherd, West Columbia, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed Oct. 7, 1976, Ser. No. 730,160
Int. Cl.[2] D01H *7/26, 7/50*
U.S. Cl. 57—68 **7 Claims**



1. Filament spooling apparatus comprising:
a spool shaft;
a filament receiving spool non-rotatably mounted on said spool shaft for translational reciprocation;
a winding means disposed at least in part radially of said filament receiving spool including
a flier having a hub, spacer arms extending outwardly of said hub in diametric opposition,
a positioning rod mounted transversely of each said spacer arm to be disposed substantially parallel to said spool shaft,
a pick-up and turning head carried on one said positioning arm and a counterweight mounted on the other of said positioning rods, said pick-up and turning head including a mounting plate secured to the positioning rod on which the pick-up and turning head is mounted, a thread catcher mounted in spaced relation with respect to said mounting plate and a sheave rotatably journaled between said mounting plate and said thread catcher; and
means to rotate said winding means with respect to said filament receiving spool, said means to rotate being operatively connected to said hub.

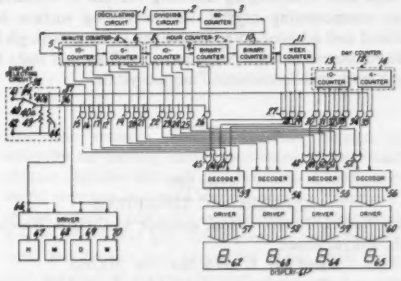
3. Filament spooling apparatus, comprising:
a spool shaft;
a filament receiving spool mounted on and having an axis coincident with said spool shaft for translational reciprocation;
a lead-in pulley located axially outwardly of said receiving spool and mounted to rotate about an axis oriented substantially transversely with respect to the axis of said receiving spool;
a winding means disposed at least in part radially of said filament receiving spool;
means to effect relative rotation between said winding means and said filament receiving spool;
means provided in conjunction with said lead-in pulley to preclude any twist imparted to that portion of the filament extending from one side of said lead-in pulley from being transmitted to that portion of the filament extending from the other side of said lead-in pulley; and
an orienting pulley presented in proximity to that end of the filament receiving spool axially opposite the lead-in pulley, a feed and a tailing run of filament extending between said lead-in and orienting pulleys, said orienting pulley being canted to effect selective engagement of said feed run by said winding means.

4,085,575

DIGITAL ELECTRONIC TIMEPIECE

Kojiro Tanaka, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sep. 21, 1976, Ser. No. 725,329
Claims priority, application Japan, Sep. 22, 1975, 50-114540
Int. Cl.[2] G04B *19/24, 19/34;* **G04C** *3/00*
U.S. Cl. 58—4 A **3 Claims**



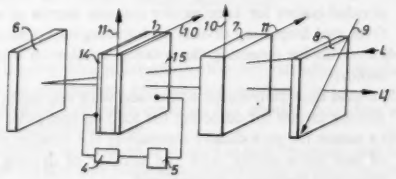
1. A digital electronic timepiece displaying the time and the day of the week, comprising a numeric display means for selectively displaying only numbers, said display means comprising a plurality of display elements each of which comprises means for selectively displaying a digit, display selecting means controlling said display means to display the time and alternatively to display a number representing a day of the week, said number representing a day of the week being selectively displayed by one of the same display elements as used for displaying time, and means coordinated with said display selecting means to indicate whether time or day of the week is displayed.

4,085,576

MONOCRYSTALLINE DISPLAY DEVICE WITH STORAGE EFFECT FOR AN ELECTRONIC TIMEPIECE

Jacques Alain Deverin, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

Filed Sep. 11, 1974, Ser. No. 504,891
Claims priority, application Switzerland, Sep. 27, 1973, 13824/73
Int. Cl.[2] G04C *3/00;* **G04B** *19/06;* **G11B** *9/02;* **G02B** *5/23*
U.S. Cl. 58—23 R **10 Claims**



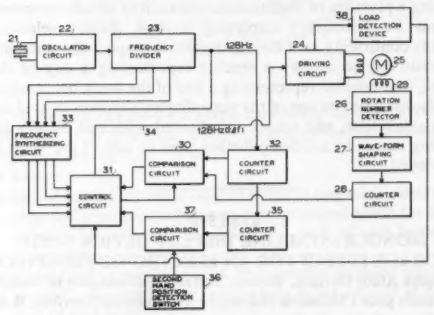
1. Display arrangement exhibiting a storage effect for use with an electronic timepiece which timepiece includes a time standard, an electronic control circuit, an energy source and

voltage increasing means wherein is provided one single domain ferroelectric monocrystal belonging to a relatively low symmetry group in order to assure different optical properties for different orientation domains selected from the group consisting of sodium nitrate, lead germanate, bismuth titanate, and crystals having polar symmetry in enantiomorphous and non-enantiomorphous classes having symmetry: $1=C_1$, $2=C_2$, $m=C_{1h}$, $mm2=C_{2v}$, $4=C_4$, $3=C_3$, electrode means arranged and adapted to apply voltage pulses from the control circuit to the crystal thereby to cause said crystal to change in a reversible manner from a first to a second stable state, said first and second stable states being optically different, at least one polarizing filter located proximate one face of the crystal, a reflecting surface located proximate the opposite face thereof, and a second ferroelectric monocrystal of substantially the same composition, cut, and crystallographic orientation as said one ferroelectric monocrystal positioned between said polarizing filter and said reflecting or diffusing surface to constitute a passive compensating crystal, said reflecting surface being positioned and adapted to receive light passing through both said ferroelectric monocrystals and to reflect said light back through both said ferroelectric monocrystals.

4,085,577
ELECTRONIC TIMEPIECE

Minoru Natori, Tokyo, Japan, assignor to Citizen Watch Co. Ltd., Tokyo, Japan

Filed Jul. 1, 1976, Ser. No. 701,655
Claims priority, application Japan, Jul. 2, 1975, 50-81573
Int. Cl.[2] G04C *3/00*; G05B *5/01*
U.S. Cl. 58—23 D **5 Claims**



1. An electronic timepiece driven by a pulse motor comprising:

(1) a time standard signal generator:

(2) a frequency divider connected to said time standard signal generator;

(3) a pulse motor driving circuit applied by frequency-divided pulses for keeping the rotation inertia of a rotor from said frequency divider and driving said pulse motor;

(4) a means for detecting the rotation number of said pulse motor;

(5) a load detection means connected with said pulse motor driving circuit for detecting the load on said pulse motor;

(6) a means for periodically comparing the rotation number of said pulse motor with the number of driving pulses from said frequency divider; and

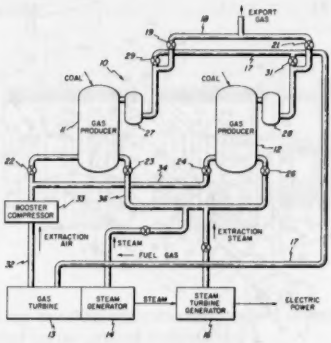
(7) a control means including means for selecting the driving frequency of said pulse motor; and

whereby a second hand of said electronic timepiece is continuously carried.

4,085,578
PRODUCTION OF WATER GAS AS A LOAD LEVELING APPROACH FOR COAL GASIFICATION POWER PLANTS

Paul H. Kydd, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 634,468, Nov. 24, 1975, abandoned.
This application Mar. 14, 1977, Ser. No. 777,328
Int. Cl.[2] F02B *43/08*
U.S. Cl. 60—39.02 **14 Claims**



8. In a process for generating electric power in an integrated coal gasification plant wherein low BTU gas is produced from coal introduced into fixed bed coal gasifiers, said coal gasifiers being connected to systems for cleaning the low BTU gas, the low BTU gas after cleanup is conducted to at least one combustor, each such combustor being part of a system for the generation of system and production of electric power, and air from a boost compressor together with steam from said system are supplied to the underside of the beds of said coal gasifiers, the improvement comprising:

alternately operating said coal gasifiers in the base load mode of power generation in which all of said coal gasifiers receive a continuous blast of steam and air to generate low BTU gas and in the mid-range mode of power generation in which said coal gasifiers are utilized as first and second sets of coal gasifiers, said first set being operated to generate low BTU gas with a compressed air blast for delivery to said at least one combustor and said second set being simultaneously operated to generate intermediate BTU gas with a steam blast for discharge from said coal gasification plant and the operation of said first and second sets is periodically interchanged.

4,085,579
METHOD AND APPARATUS FOR IMPROVING EXHAUST GASES OF A GAS TURBINE INSTALLATION

Immanuel Holzapfel, Stuttgart, and Werner Bruder, Neckarrems, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 3, 1975, Ser. No. 564,918
Claims priority, application Germany, Apr. 6, 1974, 2416909
Int. Cl.[2] F02C *7/02, 9/14*
U.S. Cl. 60—39.04 **52 Claims**

1. A method for operating a gas turbine installation which includes a combustion chamber having a combustion zone, and in which air is compressed and heated up by utilizing the exhaust gas heat of the gas turbine installation, fuel is combusted with an air excess under supply of compressed air forming a primary air, and resulting gas of the combusted fuel is thinned out by an admixture of compressed heated air forming a secondary air and is cooled off to produce gases which are expanded while giving off a useful output, the method comprising the steps of:

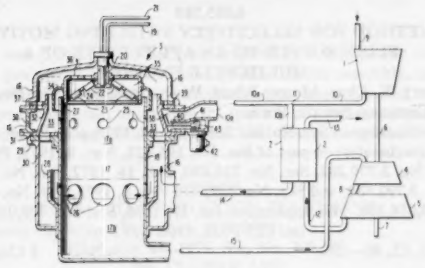
admixing a more or less large quantity of non-preheated air

to the preheated primary air in a mixing chamber disposed outside of the combustion chamber,

directing the flow of admixed non-preheated air and preheated primary air into the combustion chamber and combustion zone at least within a lower partial load range, the step of admixing the non-preheated air to the preheated primary air in the mixing chamber takes place as a function of load,

and controlling the rate of air flow of the gas turbine installation so that at most approximately 15% of the rate of air flow of the gas turbine installation in non-preheated air is admixed.

9. A gas turbine installation comprising compressor means for compressing air, heat-exchanger means for heating the compressed air by utilizing the exhaust gas heat of the gas turbine installation, combustion chamber means for combust-



ing fuel with an excess of air under supply of compressed air constituting the primary air, means for thinning resulting gas of the combusted fuel by an admixture of compressed heated air constituting secondary air and cooling the same for producing gases for use in turbine means, and means including said turbine means for expanding the produced gases while producing a mechanical output, characterized in that a mixing chamber means is disposed outside of said combustion chamber means for intimately combining and mixing a more or less large quantity of substantially non-preheated air to the preheated primary air prior to the entry thereof into a combustion zone of the combustion chamber means at least within a lower partial load range, means operable as a function of the load of the gas turbine installation for controlling the amount of non-preheated air so that at most approximately 15% of the rate of air flow of the gas turbine installation is admixed in non-preheated air by said controlling means.

4,085,580

COMBUSTION CHAMBERS FOR GAS TURBINE ENGINES

Sidney Edward Slattery, Foston, England, assignor to Rolls-Royce Limited, London, England

Filed Nov. 16, 1976, Ser. No. 742,181

Claims priority, application United Kingdom, Nov. 29, 1975, 49138/75

Int. Cl.² F02C *7/18*

U.S. Cl. 60—39.65 **10 Claims**

1. An axially extending combustion chamber for a gas turbine engine, the combustion chamber having an upstream wall for admission of air to the interior of the chamber and for cooling the wall, said upstream wall comprising:

a perforated upstream meter panel and a perforated heat shield member spaced axially downstream of said perforated meter panel, said perforated meter panel and said perforated heat shield member defining a plenum chamber therebetween whereby in operation of the engine, air passes through said perforated upstream meter panel into said plenum chamber and impinges on the upstream side of said perforated heat shield to cool the same, said heat shield member having a plurality of enlarged openings therein in addition to the perforations, a plurality of deflector plates axially spaced downstream from said perforated heat shield member in alignment with said openings, each of said deflector plates having a dimension greater than each of said openings, and said heat shield member and said deflector plates defining a plurality of second plenum chambers axially downstream of said first plenum chamber, each of said second plenum chambers having at

least one radially directed aperture formed therein whereby air passing axially downstream from said first plenum chamber through said openings in said perforated shield member into said second plenum chambers is directed radially outwardly as a cooling film over the downstream side of said heat shield member to further cool the same and protect said perforated meter panel from heat within said combustion chamber.

4,085,581

GAS-TURBINE COMBUSTOR HAVING AN AIR-COOLED SHIELD-PLATE PROTECTING ITS END CLOSURE DOME

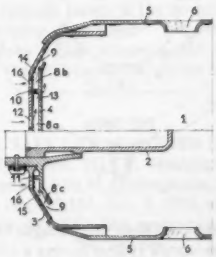
Jacques Emile Jules Caruel, Dammarie-les-Lys, and Guy Daniel Stora, Melun, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed May 27, 1976, Ser. No. 690,669

Claims priority, application France, May 28, 1975, 75 17087

Int. Cl.² F02C *7/22*

U.S. Cl. 60—39.66 **4 Claims**



1. In a gas-turbine combustion chamber extending longitudinally from an upstream end which comprises:

longitudinal side walls opposite one another bounding said combustion chamber;

a transverse dome-shaped closure at said upstream end connecting said side walls and mechanically uniting the same to form an integral box-like structure capable of withstanding mechanical stresses;

a transverse shield-plate within said chamber extending adjacent to and spaced inwardly of said dome-shaped closure to thermally screen the same, said shield-plate

being so mounted with respect to said integral structure as to be substantially unaffected by mechanical stresses withstood thereby; and

prevaporized fuel injecting means projecting into said combustion chamber from said dome-shaped closure through said shield-plate and having a portion bent back to discharge fuel in an upstream direction towards and onto the downstream-facing side of said shield-plate;

wherein the improvement comprises

means positioned between said dome-shaped closure and said shield-plate to partition the space between said dome-shaped closure and the upstream-facing side of said shield-plate into a plenum;

compressed air passage means opening through said dome-shaped closure into said plenum to feed the same with compressed air and to cool said shield-plate by impact on said upstream-facing side thereof by air jets formed by said passage means; and

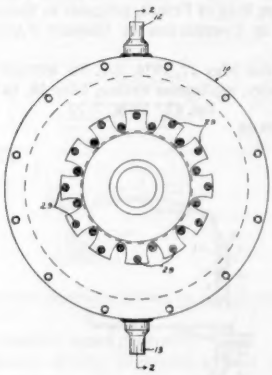
a plurality of outwardly-inclined elemental nozzles extending through said shield-plate from said plenum and having a total cross-sectional area which is substantially smaller than the total cross-sectional area of said compressed air passage means, said elemental nozzles functioning to issue high-velocity air jets from the air located in said plenum through said shield-plate whereby any liquid fuel streaming over said downstream-facing side is atomized by said high-velocity air jets and said air jets increase local turbulence adjacent said downstream-facing side.

4,085,582

WALL AND NOZZLE ASSEMBLY FOR COLLOIDAL CORE REACTOR

Brian A. Hausfeld, Dayton, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 4, 1976, Ser. No. 738,915
Int. Cl.[2] G21D *1/00*
U.S. Cl. 60—203 **1 Claim**



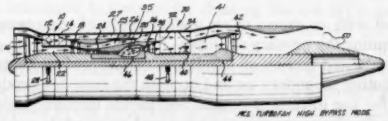
1. In a multi-component flow small length to diameter ratio confined particulate vortex system having a cylindrical chamber with a first wall member and a second wall member spaced from the first wall member; means for providing a flow of low molecular weight gas into said chamber; means, including a plurality of gas flow directing vanes, having slots therebetween, for providing a vortex flow within said chamber; said gas flow directing vanes dividing said chamber into an outer annular plenum chamber and an inner vortex chamber; means for providing a flow of particles into said chamber; a wall and nozzle assembly for said confined vortex system comprising: a vortex chamber exit nozzle; said nozzle having a wall member extending radially therefrom and forming a portion of said first wall member; said exit nozzle being coaxial with the inner vortex chamber; an annular manifold, in said first wall member and surrounding said exit nozzle; means for supplying a low molecular weight gas to said manifold; a plurality of annular slots in the first wall member on the side of said first wall adjacent said inner vortex chamber; means connected between said manifold and said annular slots for directing a flow of gas through the annular slots into the inner vortex chamber radially outward adjacent said first wall; said means for directing the flow through the annular slots including means for providing a circumferential flow to the gas in a direction corresponding to the flow in the inner vortex chamber; means within said wall and nozzle member for supplying a flow of gas to the throat of said nozzle; said means for supplying a flow of gas to the throat of said nozzle including means for providing a circumferential flow to the said gas in a direction corresponding to the direction of flow in the inner vortex chamber.

4,085,583

METHOD FOR SELECTIVELY SWITCHING MOTIVE FLUID SUPPLY TO AN AFT TURBINE OF A MULTICYCLE ENGINE

Garry W. Klees, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 563,538, Mar. 31, 1975, abandoned, and a continuation-in-part of Ser. No. 196,422, Nov. 8, 1971, Pat. No. 3,779,282, Ser. No. 226,850, Feb. 16, 1972, Pat. No. 3,792,584, and Ser. No. 329,768, Feb. 5, 1973, Pat. No. 3,854,286. This application Jul. 27, 1976, Ser. No. 709,059
Int. Cl.[2] F02K *3/06, 3/12*
U.S. Cl. 60—204 **4 Claims**



1. In a multicycle engine for a supersonic aircraft which includes a forwardly located fan means; a core gas generator including compressor, combustor, and turbine stages; an aft turbine stage located downstream of said core gas generator and a second combustor stage located upstream of and adjacent to said aft turbine stage to provide combustion gases acting directly on said aft turbine stage; a method for improving engine cycle efficiency comprising;

passing air through said fan means and said core gas generator and discharging it into a region surrounding said aft turbine stage;

passing air through said fan means and around said core gas generator then into and through said second combustor stage; and

switching the air passing through said core gas generator from its path into said region surrounding said aft turbine stage such that it passes into and through said second combustor stage and said aft turbine stage.

4,085,584

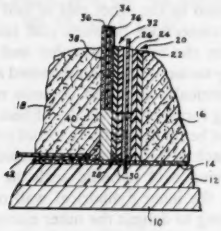
BARRIER SYSTEM FOR DUAL-PULSE ROCKET MOTOR

Roy A. Jones, Crawford, and Marshall W. Mabry, Waco, both of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Nov. 5, 1976, Ser. No. 734,158
Int. Cl.[2] F02K *9/04*
U.S. Cl. 60—250 **1 Claim**

1. A barrier system for use in dual pulse, solid propellant rocket motors comprising an assembly positioned between a first and second pulse rocket propellant gain, said assembly being adhesively attached at one end to the interior diameter of a rocket motor case liner and composed of (1) a restrictor assembly having (a) a dual layer of rubber with one surface thereof positioned adjacent to said first pulse grain to function

as a grain inhibitor and flame barrier during the burnout of the said first pulse grain and (b) a thin plastic film positioned adjacent to the other surface of said dual layer of rubber; (2) a thermal barrier assembly having a dual layer of rubber positioned adjacent to said thin plastic film of said restrictor assembly; and (3) an igniter assembly covered by a thin plastic film and positioned adjacent to said thermal barrier assembly, and interdisposed between said thermal barrier assembly and said second pulse grain to activate the ignition of said second pulse grain subsequent to the burnout of said first pulse grain.

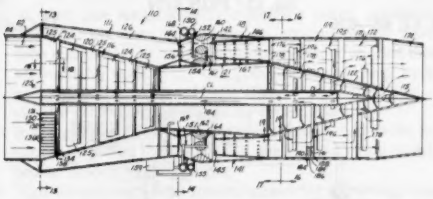


4,085,585

IMPACTION/INDUCTION JET ENGINE

Thomas H. Sharpe, Belvedere, S.C. 29841

Filed Jun. 28, 1976, Ser. No. 700,488
Int. Cl.[2] F02K *1/02*
U.S. Cl. 60—262 **9 Claims**



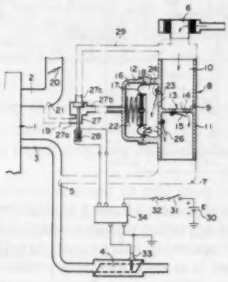
1. An impaction and induction jet engine comprising:
- a fresh air duct having a leading end and a trailing end, said fresh air duct open to the atmosphere at its leading end and closed at its trailing end;
- a burner unit having a burner inlet and a burner outlet;
- a compressor air impaction unit associated with said fresh air duct adjacent its leading end, said compressor air impaction unit including a plurality of air impaction vanes positioned in said fresh air duct and an impaction duct communicating with said burner inlet and said air impaction vanes, each of said air impaction vanes defining an air impaction passage therein, a forwardly facing air inlet opening to said air impaction passage in said fresh air duct, and an air outlet opening from said air impaction passage to said impaction duct so that a portion of the fresh air flowing through said fresh air duct will impact in said air impaction passage and be transferred to said impaction duct so that the separated portion of the fresh air in said impaction duct will be received through the burner inlet;
- fuel injector means for injecting fuel into said burner unit to form a combustible air-fuel mixture in said burner unit so that the exhaust gases will be directed out of said burner outlet; and,
- an air induction unit connected to said burner unit for receiving the exhaust gases from said burner outlet, said air induction unit connected to said fresh air duct adjacent its trailing end and constructed and arranged to cause fresh air from said fresh air duct
- to be induced into the exhaust gases as the gases pass through said air induction unit and cause additional fresh air from the atmosphere to be drawn into said fresh air duct and through said compressor air impaction unit.

4,085,586

SECONDARY AIR SUPPLY SYSTEM FOR INTERNAL COMBUSTION ENGINES

Norio Shibata, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 4, 1976, Ser. No. 693,125
Claims priority, application Japan, Feb. 26, 1976, 51-20499
Int. Cl.[2] F01N *3/10*
U.S. Cl. 60—277 **4 Claims**



1. A secondary air supply system for an internal combustion engine having intake and exhaust manifolds comprising:
- an air passage means having an upstream end opened to the atmosphere and a downstream end connected to the exhaust manifold of the engine;
- first and second air pumping means incorporated in parallel in said air passage means;
- said first air pumping means being a check valve which allows air to flow through said air passage means only from the upstream end toward the downstream end thereof;
- said second air pumping means being a diaphragm pump comprising a casing member, a diaphragm mounted in said casing member and defining an actuating chamber and a pumping chamber in said casing member;
- a first check valve which connects said pumping chamber to said air passage means at the upstream side of said first air pumping means;
- a second check valve which connects said pumping chamber to said air passage means at the downstream side of said first air pumping means; and
- a conduit means which connects said actuating chamber directly to the intake manifold of the engine.

4,085,587

FAIL SAFE LIQUID POWER DEVICE

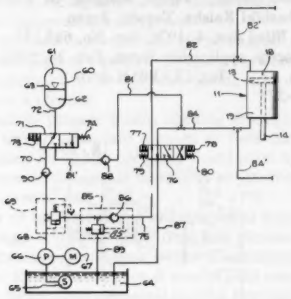
Ronald E. Garlinghouse, 2415 E. Washington, Duarte, Calif. 90021, assignor to Leslie H. Garlinghouse, Los Angeles, Calif.

Division of Ser. No. 628,154, Nov. 3, 1975, abandoned, and Ser. No. 776,101, Mar. 10, 1977. This application Dec. 8, 1976, Ser. No. 748,484
Int. Cl.[2] F15B *11/06*
U.S. Cl. 60—403 **10 Claims**

1. In a system for performing work by operation of a hydraulic ram having a piston therein forming in said ram a forward chamber and a reverse chamber,
- said system comprising a source of fluid at operating pressure,
- a fluid pressure storage container including fluid passage means connecting said container to said source,
- operating valve means having fluid passage means interconnecting said operating valve means with said source, said container and said ram for selectively directing fluid at said operating pressure to said chamber,

said operating valve means having one adjustment wherein said operating pressure is passed to said forward chamber and said reverse chamber has a connection to exhaust,

sequence valve means interconnected respectively to said container, said source and said control valve means, and energizing means for said valve means,



said sequence valve means having an adjustment at pressures less than said operating pressure which inhibits passage of fluid by said operating valve means to said chambers until said container is at said operating pressure,

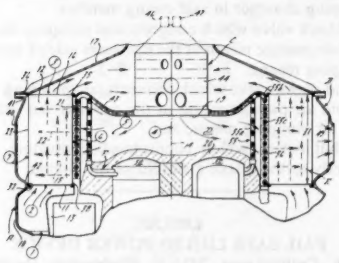
said operating valve means having another adjustment wherein said operating pressure is passed to said reverse chamber and said forward chamber has a connection to exhaust.

4,085,588

CONCENTRIC CROSSFLOW RECUPERATOR FOR STIRLING ENGINE

Lowell A. Reams, Plymouth, and Thomas F. Dunlap, Riverview, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 5, 1976, Ser. No. 673,789
Int. Cl.² F02G *1/04*
U.S. Cl. 60—517 **2 Claims**



1. In a Stirling engine having an external heating circuit in a closed working fluid system, an assembly for transferring heat from said circuit to said closed working fluid system, comprising:

(a) an induction means for providing a positive supply of air to said circuit,

(b) an exhaust means for said circuit,

(c) a combustion unit for adding fuel to said inducted supply of air and for combusting said air mixture,

(d) a heating chamber receiving the products of combustion from said combustion unit and within which is disposed a heater tube array for absorbing a predetermined heat content of said combustion products passing thereabout, and

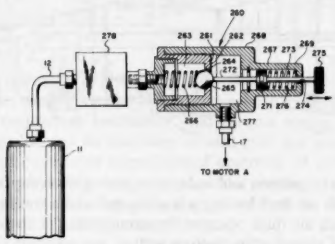
(e) heat exchange means having a fixed matrix concentrically arranged about the axis of said heater tube array, said fixed matrix having walls defining layers of first passages interleaved with walls of defining layers of second passages, said induction means being fluidly connected to one end of said first passages and the combustion unit being fluidly connected to the other end of said first passages, said exhaust means being fluidly connected to one end of said second passages and the heating chamber being fluidly connected to the other end of said second passages, said fluid connections between said intake and exhaust, and between the heating chamber and burner unit, are provided by ceramic ring seals disposed along the edges of said concentrically arranged ceramic matrix, said fixed matrix being formed substantially of heat resisting ceramic material and being defined as a toroid comprised of fused segments, each of the edges of said toroid at opposite faces thereof having said ceramic seals in intimate contact therealong, the inner cylindrical wall of said concentric matrix serving to delimit the outer extremity of said heating chamber, said heating chamber needing no external side insulation other than the ceramic matrix.

4,085,589

GAS POWERED MOTOR AND SYSTEM

John H. Breisch, Lakewood, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 633,425, Nov. 19, 1975, which is a division of Ser. No. 483,575, Jun. 27, 1974, Pat. No. 3,981,229, which is a continuation-in-part of Ser. No. 378,334, Jul. 11, 1973, abandoned, which is a division of Ser. No. 173,832, Aug. 23, 1971, abandoned. This application Jan. 22, 1976, Ser. No. 651,548
Int. Cl.² F02N *9/04*
U.S. Cl. 60—626 **17 Claims**



1. A gas powered starting system for two and four cycle internal combustion engines preferably of a size that delivers less than 10 horsepower and possesses in its cycle a compression stroke at the end of which said engine is fired, said system comprising:

an energy cell containing liquified gas under pressure;

a motor having an output shaft;

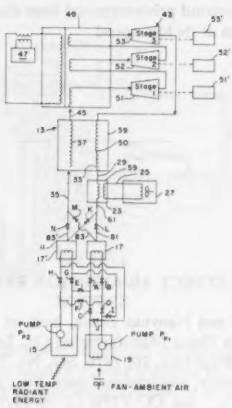
clutch means engaging said output shaft to permit said motor to drive said engine through its cycles for starting same; and

self-regulating metering valve means in fluid communication with said energy cell and said motor, said self-regulating valve means comprising a valve for controlling the flow of gas from said energy cell, a fluid passage between said energy cell and said valve and a fluid passage between said valve and said motor, said valve being operable to cut off flow of gas from said energy cell through said valve while permitting gas in said fluid passage between said valve and said motor to expand and flow to and operate said motor after said valve has cut off the flow of gas from said energy cell, whereby said valve means is operable to automatically meter an amount of gas within a predetermined range from said energy cell to said motor sufficient to enable said motor to start said engine.

4,085,590
HYDRIDE COMPRESSOR

James R. Powell, Wading River, and Francis J. Salzano, Patchogue, both of N.Y., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 5, 1976, Ser. No. 646,703
Int. Cl.[2] F01K *25/10*
U.S. Cl. 60—673 1 Claim



1. Apparatus for producing hydrogen gas power comprising:

a. at least one longitudinally extending outer, nonporous, chemical pressure tube means containing inner, porous tube means having a metal hydride bed sandwiched therebetween for selectively desorbing and adsorbing hydrogen gas and having a longitudinally extending heat exchange jacket around the outer tube means;

b. low temperature heat source means connected to the heat exchange jacket for selectively heating the metal hydride bed to desorb hydrogen gas;

c. high temperature heat source means for receiving, transporting and further heating the desorbed hydrogen gas;

d. power extraction means for receiving and extracting power from the further heated hydrogen gas;

e. regenerator means for transferring heat from the hydrogen gas leaving the power extraction means to the desorbed hydrogen gas prior to the desorbed hydrogen gas entering the high temperature heat source; and

f. cooling means connected to the heat exchange jacket for controlling the temperature of the metal hydride bed by selectively rejecting heat therefrom to the surroundings during adsorption of the hydrogen gas leaving the regenerator means.

4,085,591
CONTINUOUS FLOW, EVAPORATIVE-TYPE THERMAL ENERGY RECOVERY APPARATUS AND METHOD FOR THERMAL ENERGY RECOVERY

Lawrence E. Bissell, 1242 26th St., Apt. B, Santa Monica, Calif. 90404

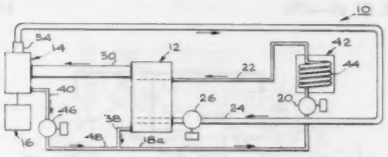
Filed Sep. 23, 1975, Ser. No. 615,931
Int. Cl.[2] F01K *21/04*
U.S. Cl. 60—674 17 Claims

1. An evaporative-type thermal energy recovery apparatus, which comprises:

a. a source of volatile liquid,

b. a source of gaseous fluid,

c. evaporator means including a mixing chamber connected to said liquid and gaseous fluid sources for causing evaporation within said chamber of at least a portion of liquid from said liquid source into gaseous fluid from said gaseous fluid source, said mixing chamber including a first elongated pipe extending transversely of the chamber in the upper portion thereof, said pipe being connected to said liquid source and having a series of perforations located about the pipe and along its length inside the chamber for releasing liquid within the chamber, and a second pipe extending transversely of the chamber within a lower portion thereof, said second pipe being connected to the gaseous fluid source and having a series of enlarged



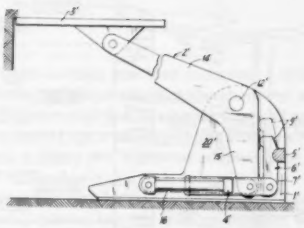
openings along the upper side of said second pipe within the mixing chamber for releasing said gaseous fluid into contact with liquid dropping from the first pipe perforations, and

d. a prime mover connected to said evaporator means for receiving gaseous fluid and evaporated liquid therefrom and being operative thereby for the production of work, electrical energy or the like.

4,085,592
SHIELD TUBBING FOR LONGWALLS

Werner Dahlem, Moers, Germany, assignor to Rheinstahl AG, Germany

Filed Feb. 5, 1976, Ser. No. 655,155
Claims priority, application Germany, Feb. 13, 1975, 2506076
Int. Cl.[2] E21D *15/44*
U.S. Cl. 61—45 D 7 Claims



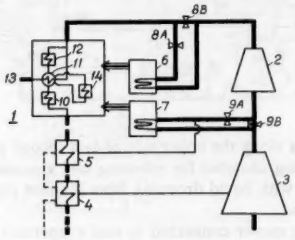
1. A shield tubbing for longwalls, comprising a support tub, a break shield, break shield pivotal support means pivotally supporting said break shield on said tub, a double arm balance beam having first and second arms, balance beam support means pivotally supporting said balance beam on said tub, a hydraulic ram having one end acting adjacent the end of said balance beam first arm and an opposite arm connected to said break shield, said second arm of said balance beam bearing on said shield between said pivotal support means and the connection of said ram to said shield.

4,085,593

STEAM POWER PLANT WITH FLUIDIZED BED HEAT SOURCE FOR SUPERHEATER AND METHOD OF PRODUCING SUPERHEATED STEAM

Gunnar Larsen, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Sep. 7, 1976, Ser. No. 720,527
Claims priority, application Sweden, Sep. 12, 1975, 7510165
Int. Cl.[2] F01K *3/24*
U.S. Cl. 60—676 10 Claims



1. A steam generating plant for a turbine machine comprising

(a) a steam boiler;

(b) a superheating means comprising at least two stages;

(c) the first of said stages being integral with said steam boiler and being heated from a common heat source therewith;

(d) the second of said stages being heated separately in a fluidized bed;

(e) the first of said stages comprising means for heating steam up to a maximum of 540° C; and

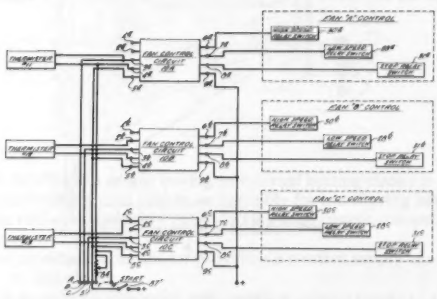
(f) the second of said stages comprising means for heating said steam above 540° C.

4,085,594

CONTROL SYSTEM FOR COOLING TOWER FANS

Robert Mayer, Ardmore, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Feb. 14, 1977, Ser. No. 768,295
Int. Cl.[2] G05B *11/18*
U.S. Cl. 62—171 6 Claims



1. A control system for automatically controlling the operation of a cooling tower fan with a two speed fan motor in response to the temperature of the coolant circuit comprising:

(a) means, responsive to the temperature of the coolant being above a predetermined first temperature, for producing a first actuating signal;

(b) means, responsive to the first actuating signal, for producing a first energizing signal having a first predetermined time duration;

(c) means, responsive to the first energizing signal, for turning the fan motor on at its low speed;

(d) means, responsive to the first energizing signal, for producing an energy termination signal having a second predetermined time duration less than said first predetermined time duration;

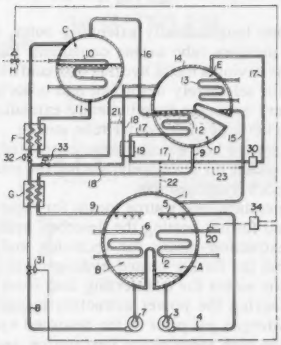
(e) means, responsive to the energy termination signal, for disconnecting power supplied to the fan motor, whereby the fan motor is first disconnected from its power supply for said second predetermined time duration before being turned on at its low speed.

4,085,595

DOUBLE EFFECT ABSORPTION REFRIGERATING SYSTEM

Shozo Saito, and Naoyuki Inoue, both of Yokohama, Japan, assignors to Ebara Manufacturing Co., Ltd., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,661
Claims priority, application Japan, Dec. 29, 1975, 50-156358
Int. Cl.[2] F25B *15/00, 33/00*
U.S. Cl. 62—476 13 Claims



1. A double effect absorption refrigerating system comprising:

an evaporator having therein a line for passing medium to be chilled;

an absorber associated with the evaporator;

a first generator associated with a heat source;

a second generator;

a condenser associated with said second generator;

means for circulating solution from the absorber to the first generator and thence to the second generator and for returning the solution to the absorber;

means for circulating refrigerant from the first generator to the evaporator through the second generator to the condenser and from at least one of the condenser and the portion of the refrigerant circulating means downstream of the second generator to the evaporator;

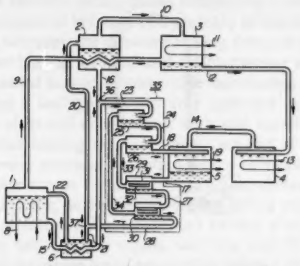
means for bypassing a portion of the solution fed from the absorber to the first generator to the second generator; and

a heat exchanger disposed in said bypassing means and arranged to effect heat transfer between the solution bypassed and the refrigerant passed through the second generator.

4,085,596
ABSORPTION REFRIGERATOR OF DOUBLE EFFECT TYPE

Seigo Miyamoto, Takahagi; Kazuo Takezoe, Ibaraki; Hayao Yahagi, Hitachi, and Shigeo Sugimoto, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 23, 1977, Ser. No. 771,209
Claims priority, application Japan, Mar. 3, 1976, 51-22114
Int. Cl.[2] F25B *15/00, 33/00*
U.S. Cl. 62—476 14 Claims



1. In a double effect type absorption refrigerator comprising a first generator for heating a weak solution to cause refrigerant to be flashed from said weak solution to produce a strong solution, a condenser for introducing said refrigerant vapor thereinto to condense and liquidize the same, an evaporator for introducing said condensed solution thereinto to produce refrigerant vapor to provide cooling, an absorber for introducing said refrigerant vapor thereinto to dilute the strong solution fed from said first generator, means for causing said weak solution to flow through said first generator, means for circulating said strong solution produced within said first generator toward said absorber, a second generator having a lower temperature than that of said first generator and through which the refrigerant vapor produced in said first generator is directed to said condenser, said second generator being arranged such that the refrigerant vapor from said first generator is caused to heat exchange with the weak solution from said absorber to flash the refrigerant and produce a strong solution said strong solution produced within the first generator flowing into the strong solution produced within the second generator to be circulated into said absorber, the improvement comprising a flash type heat exchanging means provided at a portion at which the weak solution transported from said absorber to said both generators and the strong solution transported from said both generators to said absorber flow in parallel with each other and for flashing said strong solution to produce gaseous refrigerant to be absorbed into said weak solution.

4,085,597
KNITTING MACHINE COUPLED WITH THE PROGRAM READING DEVICE

Shigeo Kamikura; Hideaki Itagaki; Yutaka Kagaya, and Ryoiti Kawaoka, all of Kodaira, Japan, assignors to Silver Seiko Co., Ltd., Tokyo, Japan

Filed Nov. 1, 1976, Ser. No. 737,433
Claims priority, application Japan, Nov. 4, 1975, 50/131534; Feb. 21, 1976, 51/17487
Int. Cl.[2] D04B *7/00, 15/66*
U.S. Cl. 66—75.2 21 Claims

1. A providing system for providing electric signals representative of data for selecting knitting needles in a needle bed of a knitting machine comprising, in combination,

a frame mounted alongside the needle bed;

a holder rotatably supported on said frame;

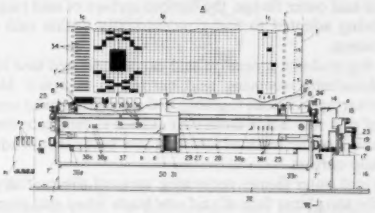
a program carrier removably supported on said holder and having thereon a program of a pattern to be knitted;

first drive means including an electromagnetic means for driving said holder to rotate around its axis thereby to incrementally feed the program carrier in one or the other direction;

a guide bar mounted in parallel with said axis;

a member slidably mounted on said guide bar;

a scanning sensor mounted on the slidable member for reading the program on said program carrier along a predetermined scanning line;



second drive means including an electric motor for driving said slidable member to move from one to the other stroke end and vice versa;

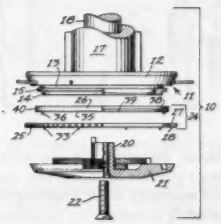
pulse generator means for generating an interval pulse each time said slidable member moves an increment; and

control means including a control circuit for controlling said first and second drive means to effect feeding of the program carrier in a selected direction and scanning by the scanning sensor.

4,085,598
RING SAW FOR CIRCULAR KNITTING MACHINE

Clarence W. Minton, 4802 Dakota Ave., Nashville, Tenn. 37209

Filed Dec. 27, 1976, Ser. No. 754,173
Int. Cl.[2] D04B *15/61*
U.S. Cl. 66—145 R 1 Claim



1. In a circular knitting machine including a welting dial having dial walls defining interstices therebetween and rotatably mounted upon a dial pad having an annular bearing surface, a knife mounted upon and depending from the periphery of the dial pad, a rotary saw apparatus adapted to be mounted between said dial and said dial pad, comprising:

(a) a discrete ring saw blade having parallel, substantially continuously planar top and bottom surfaces, a circular inner perimeter, and an outer rim forming uniformly circumferentially spaced teeth having radially projecting top and bottom planar teeth surfaces,

(b) a plurality of lugs depending from the bottom face of said ring saw blade adapted to detachably seat within interstices berween the dial walls of said welting dial for rotary movement of said ring saw blade with said welting dial in operative position,

(c) a discrete ring carrier having a top surface and a bottom planar surface, a cylindrical inner bearing surface, and a cylindrical outer flange projecting upward substantially above the top surface of said ring carrier, the outer diame-

ter of said flange being substantially less than the diameter of said outer rim of said saw blade,

(d) the inner diameter of said inner perimeter of said saw blade and said inner bearing surface of said ring carrier being substantially equal to the diameter of the annular bearing surface of said dial pad so that said carrier and said saw blade receive and rotatably engage the bearing surface of said dial pad in said operative position,

(e) an annular recess in the top face of said saw blade having an outer diameter substantially equal to the outer diameter of said outer flange, the bottom surface of said ring carrier being adapted to seat concentrically within said annular recess,

(f) dog-and-slot means on said carrier and said saw blade for detachably securing said carrier to said saw blade for rotary movement together and permitting axial separation of said saw blade from said carrier to facilitate the sharpening of the teeth of said ring saw blade independently of said carrier,

(g) said outer flange projecting upward substantially above the top planar face of said saw blade when said ring carrier is seated in said annular recess, and

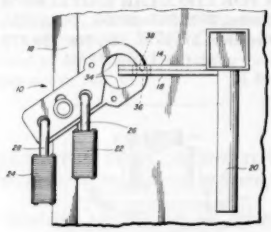
(h) only said planar top surface of said saw blade, including said top planar teeth surfaces, engaging the knife in said operative position.

4,085,599

PADLOCK ADAPTER ASSEMBLY

Don G. Fischer, Peru, and Harold Holland, Wabash, both of Ind., assignors to Square D Company, Park Ridge, Ill.

Filed May 23, 1977, Ser. No. 799,630
Int. Cl.[2] E05B *73/00*
U.S. Cl. 70—14 **8 Claims**



1. A padlock adapter assembly for use with a plurality of padlocks each having a shackle to enable any one said padlocks to be retained on said assembly while enabling said assembly to be detached from a latch element, the improvement comprising:

a pair of plates each having a pair of spaced passages with each passage adapted to be aligned with a respective spaced passage in the other plate for receiving a shackle of a respective padlock through the aligned pair of passages, and means formed adjacent one end of each plate for engagement with said latch element to prevent entrance into a closure and pivotable about an axis passing through either passage of said pair of spaced passages for releasing said means from said latch element in response to the removal of the respective shackle.

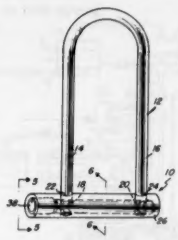
4,085,600

DOUBLE CONTACT LOCKING MECHANISM

Ahmed El Bindari, 1217 Beacon St., Brookline, Mass. 02146

Continuation-in-part of Ser. No. 646,477, Jan. 5, 1976, abandoned. This application Sep. 15, 1976, Ser. No. 723,589
Int. Cl.[2] E05B *67/06, 67/22*
U.S. Cl. 70—39 **1 Claim**

1. A padlock comprising a shackle terminating in a pair of spaced arms, said arms each having a lip thereon proximate the ends thereof, a locking pin of sufficient length, to bridge the shackle arms, said pin having at least one indented portion which rotates about the longitudinal axis of rotation of said pin, said indented portion being positioned to engage both shackle lips upon axial rotation thereof and to swing clear from said shackle arms when further rotated, lock housing means for holding said shackle lips and said indented portion in engaging proximity, means to axially rotate said locking pin into locking engagement with said shackle arms and means to further rotate said locking pin to disengage said indented portion from said



shackle arms to release said shackle to permit the opening of said padlock;

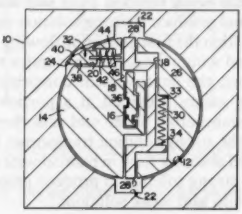
one of said shackle arms extending substantially straight to the end thereof and the other of said shackle arms extending substantially parallel to the first arm part way then bending inwardly toward said first arm then bending again to substantially parallel said first arm proximate said lock housing means to provide a protective shackle arm overhang which prevents direct blows to the lock housing said overhang limited to the axial extent of said lock housing.

4,085,601

NONPICKABLE LOCK

Kenneth D. Sauder, 1861 Brentwood Dr., Clearwater, Fla. 33516

Continuation of Ser. No. 518,108, Oct. 25, 1974, abandoned. This application Jan. 30, 1976, Ser. No. 653,743
Int. Cl.[2] E05B *29/02*
U.S. Cl. 70—364 R **1 Claim**



1. A lock comprising a housing having a bore formed therein; a cylindrical lock plug rotatably mounted within said bore, said plug having an axially extending keyway formed therein; a plurality of cross bores formed in said plug in communicating relation to said keyway; a corresponding plurality of clearance slots extending inwardly from the periphery of said plug and perpendicularly intersecting said cross bores; a plurality of lock slots formed in said housing each one being in registry with a corresponding end of one of said plurality of cross bores in the locked position of said lock; a corresponding plurality of tumbler biasing slots formed in said housing, each of said tumbler biasing slots being formed in communicating relation to a corresponding one of said clearance slots in the locked position of said lock; a corresponding plurality of tumbler means, said plurality of said tumbler means being respectively mounted for reciprocal movement in said plurality of cross bores; each of said tumbler means including one bar blocking portion on one end thereof; a plurality of tumbler spring means interposed between said plug and said plurality of

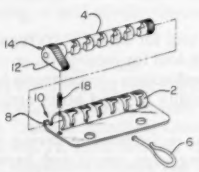
tumbler means for yieldably shifting said plurality of tumbler means in said cross bores to normally extend said bar blocking portion of each of said plurality of tumbler means into a corresponding one of said lock slots in the locked position of said lock; said bar blocking portions comprising a tongue with each of said lock slots further comprising a circumferentially extending groove dimensioned to matingly receive a corresponding one of said tongues in the unlocked position of said lock, said tumbler means being of such length as to block rotation of said plug by extending said bar blocking portions into said lock slots, said tumbler spring means comprising a plurality of leaf springs interposed between said plurality of tumbler means and said plug whereby the outward biasing force of a key exceeds the inward biasing force of said tumbler spring means when a key is inserted in said keyway, side bar biasing spring means comprising a leaf springs movably mounted in each of said clearance slots and cooperating with said tumbler means and said tumbler biasing slot to project one end of said side bar biasing spring means into contact with a corresponding one of said tumbler means to prevent movement thereof upon rotation of said plug, said side bar biasing spring means having a first end mounted to said plug and having a second end for contacting said tumbler means, said first end of said side bar biasing spring means being receivable within a slot within said cylindrical lock plug; and said side bar biasing spring means having a projecting tip portion interposed between said first and second ends for cooperation with the wall of said tumbler biasing slot upon movement of the spring.

4,085,602

KEY CASE HEAD

Oskar Alexander Hellwig, Springfield, Mass., assignor to Beatrice Foods Co., Chicago, Ill.

Filed Jun. 3, 1977, Ser. No. 803,301
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 B **2 Claims**



1. A key case head comprising an elongated inner member, an elongated generally cylindrical outer member, said inner member being adapted to move rotatably within said outer member, said inner and outer members being adapted to releasably retain key hooks therein, an actuator fixed to one end of said inner member and having recessed and non-recessed portions, said outer member having lug and recess means complemental to and adapted to receive said recessed and non-recessed portions of said inner member to interconnect said inner and outer members to permit relative rotational movement and prevent relative longitudinal movement thereof.

4,085,603

METHOD OF MAKING V-SHAPED MAGNETIC CIRCUIT ELEMENTS

Jaroslav Vanek, 35, rue des Cascades, 75020 Paris, France

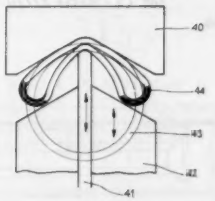
Division of Ser. No. 577,014, May 13, 1975, abandoned. This application Feb. 9, 1977, Ser. No. 767,225
Claims priority, application France, May 21, 1974, 74 17646; Oct. 18, 1974, 74 35225; Mar. 27, 1975, 75 09707
Int. Cl.² B21D *31/00*; H01F *3/04*
U.S. Cl. 72—41 **7 Claims**

1. A method for manufacturing a V-shaped magnetic circuit element comprising the following steps:

manufacturing a wound magnetic tore,

positioning said tore in a stamping die having a portion with a V-shape according to a determined angle,

punching said tore against the V-shaped portion of the stamping die to flatten the tore fully against itself into said V-shape by successively operating punches of succes-



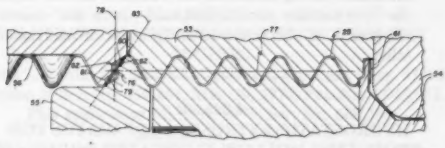
sively increasing sizes, the first of said punches being operated to press the tore toward only the neighborhood of the central area of said V-shaped portion and the last of said punches being operated to press the resulting extremities of the tore against the outer extremities of said V-shaped portion.

4,085,604

METHOD OF MAKING CORRUGATED FLEXIBLE METAL TUBING

Leroy E. Anderson; Michael P. Schmidt, and William W. Weaver, all of Detroit Lakes, Minn., assignors to Manufacturers Systems, Inc., Detroit Lakes, Minn.

Division of Ser. No. 656,389, Feb. 9, 1976. This application Nov. 8, 1976, Ser. No. 739,571
Int. Cl.² B21C *37/12*
U.S. Cl. 72—50 **7 Claims**



1. A method of forming a corrugated cylindrical tube consisting in:

(a) corrugating longitudinally an elongated narrow flat strip of readily formable metal of light gauge and forming U-shaped seam elements extending along opposite side edges thereof and facing outwardly in opposite directions at substantially right angles to the plane of the strip;

(b) progressing and helically warping said strip into and through a helically extending warping member into contiguous convolutions to form a tubular member and thereby bringing the U-shaped seam element at one side of said strip into interengaging relation with the U-shaped seam element at its opposite side, with the outer leg of each of said elements extending into and to the bottom of the other;

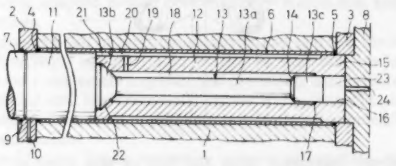
(c) deforming and compressing the legs of each of said U-shaped seam elements transversely against each other to form a seam member thereof and to constitute a common leg of a currugation for the contiguous convolutions of said strip and

(d) deforming each of the compressed elements of said seam member simultaneously intermediate its ends into the completed form of said seam and thereby bending corresponding portions of each out of its general plane in a direction transverse to its length and thereby interlocking said elements.

4,085,605
METHOD AND APPARATUS FOR PLASTIC DEFORMATION AT HIGH AMBIENT PRESSURE

Martin Burstrom; Hans Larker, and Jan Nilsson, all of Robertsfors, Sweden, assignors to ASEA AB, Vesteras, Sweden

Filed Mar. 1, 1977, Ser. No. 773,272
Claims priority, application Sweden, Mar. 4, 1976, 7603002
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—54 5 Claims



1. A method of plastically de-forming material in a high pressure cylinder provided with a pressure chamber, the material being pre-formed into a mandrel billet with an attachment portion and a piston at respective opposite ends thereof and interconnected by an intermediate portion having a smaller cross section than said piston, comprising the steps of:

fixedly securing said attachment portion by inserting a holder in said pressure cylinder including a seat for receiving said attachment portion and a groove for slidably engaging said piston, with said mandrel billet mounted in said holder, positioning said high pressure cylinder with said groove communicating with the atmosphere outside said high pressure cylinder;

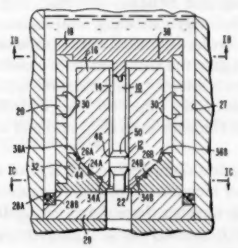
filling the pressure chamber with a pressurizable pressure medium; and

pressurizing said pressure chamber by movement of a pressure generating punch therein, whereby the pressure medium acts via the holder on the transition surface between the intermediate portion and said piston and causes an elongation of the intermediate portion of said mandrel billet.

4,085,606
HYDROSTATIC EXTRUSION APPARATUS FOR PRODUCING HOLLOW ELONGATED BODIES OF RECTANGULAR CROSS SECTION

Robert Lugosi, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 9, 1976, Ser. No. 748,971
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—60 5 Claims



1. An apparatus for hydrostatically extruding hollow, open-ended bodies of generally rectangular cross section, said apparatus comprising:

a fluid-tight pressure chamber containing a pressure transmitting medium;

a die disposed in said pressure chamber and having an opening therethrough, said opening being bounded at a first end by a tapered entrance wall and at a second end by an exit wall having an opening of rectangular cross section;

a mandrel positioned in said pressure chamber, said mandrel having a forming end which cooperates with said die in providing an extrusion path therebetween, said forming end having a periphery that changes in an axial direction from a cylindrically shaped sealing surface through a transition portion to a rectangularly shaped portion with said transition portion having a surface constituting a series of planes disposed in alternating relation with a series of curved, tapered surfaces, said planes being tangent to and extending from said cylindrically shaped surface to the sides of said rectangularly shaped portion;

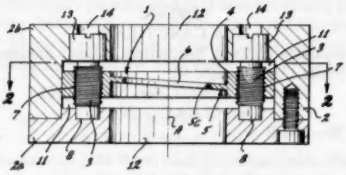
said die's tapered entrance wall including a first frusto conical surface having a first apex angle; and

means for pressurizing said pressure transmitting medium whereby said extrusion is caused to occur.

4,085,607
HELICALLY CORRUGATING TUBES

Kurt Müller, Hanover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte AG., Hanover, Germany

Filed May 2, 1977, Ser. No. 792,726
Claims priority, application Germany, May 12, 1976, 2620913
Int. Cl.[2] B21D *15/04*
U.S. Cl. 72—77 6 Claims



1. In a machine tool for helically corrugating smooth wall tubes, a corrugating tool for rotation on an axis and co-acting with a tube, the combination comprising: a housing having an opening and a plurality of blind bores arranged around that opening;

an annular means in the housing having inwardly directed helical, working edge means and having a plurality of radial grooves, further having a plurality of azimuthally arranged threaded bores; and

a plurality of bolts respectively threadedly inserted in said bores and bearing against said blind bores and being adjusted for defining a particular pitch of the annular means and of the edge means, permitting change of the pitch.

4,085,608
RETURN ELBOW AND CROSSOVER BENDER

Lawrence A. Franks, and Eugene E. Eldridge, both of Sturgis, Mich., assignors to Burr Oak Tool & Gauge Company, Sturgis, Mich.

Filed May 2, 1977, Ser. No. 792,518
Int. Cl.[2] B21D *7/02, 9/05*
U.S. Cl. 72—297 11 Claims

1. An apparatus for forming a C-shaped elbow from an elongated tubular element, comprising:

a frame;

a first forming means stationarily positioned on the frame and having a first nonlinear forming groove extending at least part way therearound;

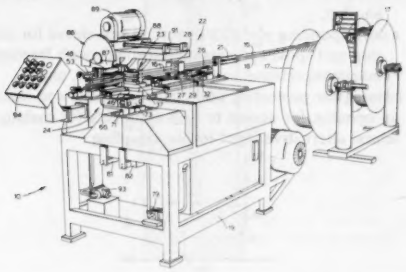
support means swingably supported on said frame for swinging about a first pivot axis which is spaced from said first groove and extends substantially perpendicular to the lengthwise direction thereof;

driving means connected to said support means to swingably

move same between first and second positions which are spaced apart by a selected angular extent;

a second forming means positioned adjacent said first forming means and having a second forming groove therein, with at least portions of said first and second forming grooves being disposed opposite one another to define a forming bore therebetween into which extends said tubular element;

intermediate supporting means for supporting said second forming means on said support means for permitting said second forming means to both pivotally move relative to said support means about a second pivot axis which is



substantially parallel to said first pivot axis and linearly moves relative to said support means within a plane which is substantially perpendicular to said first pivot axis; and

guide means coacting with said intermediate supporting means for constraining same to move along a selected nonlinear path which is substantially parallel and conforms to the nonlinear configuration of said first forming groove in response to swinging movement of said support means, whereby said opposed first and second forming grooves thus define said forming bore therebetween which is progressively displaced along said first groove in response to swinging of said support means to cause progressive bending of said tubular element.

4,085,609

DROPWEIGHT SAMPLE TESTER

John H. Kelly, Burlington, Canada, assignor to The Steel Company of Canada, Limited, Hamilton, Canada

Filed Sep. 22, 1976, Ser. No. 725,399
Claims priority, application Canada, Jul. 26, 1976, 257740
Int. Cl.² G01N *3/30*
U.S. Cl. 73—101 **1 Claim**

1. Apparatus for determining the energy absorbed by an elongated test-piece of material during fracture thereof, comprising:

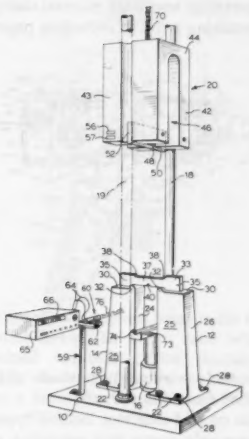
support means for supporting the test-piece during fracture including anvil means at either end of the test-piece;

a dropweight, vertical guide means for the dropweight, means for raising the dropweight along the guide means, and means for releasing the dropweight from a raised position directly above the test-piece to undergo substantial free-fall vertically after release,

and means for measuring a determining characteristic of the motion of the dropweight after the test-piece has been fractured, the latter means including two retro-reflective areas affixed in vertically separated relation on the dropweight, a photoelectric beam projecting such that the retro-reflective areas pass sequentially into said beam, light-detecting means for sensing light reflected from said areas and for generating two time-separated electrical signals as the two areas pass sequentially into the beam, and electronic period-counter means to measure the time elapsing between the two electrical signals,

the dropweight being an integral mass of metal shaped to define tow downwardly extending, laterally spaced-apart arms joined integrally together at the top thereby providing an internal slot extending upward from the bottom, the

said guide means maintaining the dropweight in an orientation such that the test-piece is aligned with said internal slot, the dropweight including a striker bar supported horizontally across and at right-angles to said slot and said test-piece, whereby the striker bar contacts the test-piece substantially mid-way of each so that the fractured sepa-



rated ends of the test-piece can pivot inwardly and into the slot above the striker bar, thus avoiding interference with the further downward free-fall of the dropweight.

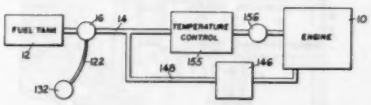
and means directly beneath the initial test-piece location for catching and decelerating the dropweight after fracture of the test-piece.

4,085,610

COMPENSATED FUEL MEASURING SYSTEM FOR ENGINES

Curtis L. Erwin, Jr., 5805 SE. Gladstone, Portland, Oreg. 97206

Division of Ser. No. 456,264, Mar. 29, 1974, Pat. No. 3,949,602.
This application Mar. 22, 1976, Ser. No. 669,292
Int. Cl.² G01F *9/00*
U.S. Cl. 73—113 **35 Claims**



34. A compensated measuring system in combination with an engine, fuel supply means for said engine, slow flow type volumetric measuring means measuring fuel flow in said measuring system, compensating means in said system arranged to compensate the measurement of said measuring means for variations in the physical characteristics of the fuel, and indicating means arranged to indicate the compensated rate of fuel flowing through said measuring means.

4,085,611

RECORDING COMPRESSION TESTING METER

Edwin L. Schwartz, Los Angeles, Calif., assignor to Rite Autotronics Corporation, Los Angeles, Calif.

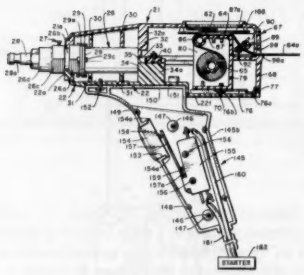
Filed Jun. 24, 1977, Ser. No. 809,638
Int. Cl.² G01M *15/00*
U.S. Cl. 73—115 **12 Claims**

1. In a meter for testing the compression pressure developed

by an engine piston in an engine cylinder, the pressure being transmitted by a tube to a measuring cylinder from the spark-plug hole of the engine cylinder and a measuring piston located within the measuring cylinder to move an indicator in response to compression pressure; the improvement comprising:

a casing containing said measuring cylinder and being open at the one end;

a removable cartridge insertable into said casing at said open end and containing a roll of recording paper;



a platform on said cartridge over which said paper passes when unrolled from said roll; and

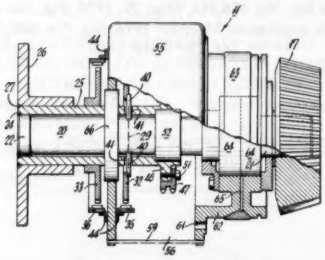
marking means on said indicator located opposite said platform and movable across said recording paper on said platform in order to indicate increase in compression pressure in said measuring cylinder with successive strokes of said engine piston.

4,085,612

HEAVY DUTY TORQUE COUPLING

Herbert A. Rundell, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,483
Int. Cl.[2] G01L *3/10*
U.S. Cl. 73—136 A **1 Claim**



1. Heavy-duty dynamic high-torque measuring coupling unit for transmitting a torque load in connection with rotary drilling employing a rotary table, comprising in combination

a shaft for transmitting said torque load and having an output end and an input end,

flange means integrally attached to said shaft at said input end for making a direct longitudinal torque coupling,

gear means mounted on said output end for transmitting said torque load to said rotary table,

means for dynamically measuring the relative angular displacement between said input end of said shaft and a predetermined location spaced along said shaft between said input and said output ends thereof, comprising

a dynamic torque meter having a pair of rotors and stators,

a plurality of spokes for attaching a first of said rotors to said shaft at said predetermined location,

alternative means for making a lateral input torque coupling at said input end of shaft, comprising

a coaxial sleeve surrounding said shaft,

a pair of chain sprockets securely attached to said sleeve, and

welding means for securely attaching said sleeve to said shaft at said input end thereof,

said means for dynamically measuring also comprises means for attaching a second of said rotors to said sleeve on the opposite side of said first rotor from said pair of chain sprockets,

unitary means for supporting said stators adjacent to one another,

a corresponding plurality of slots in said sleeve for permitting said spokes to pass therethrough with freedom for maximum relative angular displacement, and

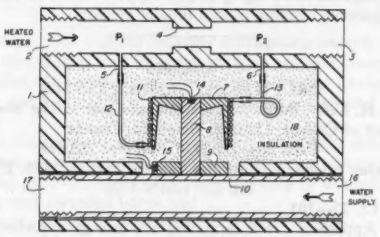
a housing for protecting said chain sprockets and including an opening for access to said sprockets for making said lateral alternative input torque coupling.

4,085,613

THERMAL ENERGY FLOWMETER

Joseph D. Richard, 3613 Loquat Ave., Miami, Fla. 33133

Filed Mar. 7, 1977, Ser. No. 774,932
Int. Cl.[2] G01K *17/08*
U.S. Cl. 73—193 R **10 Claims**



1. Apparatus for measuring heat conveyed by a flowing fluid comprising:

a conduit adapted to receive a flowing fluid;

a constriction within said conduit for providing differential pressure proportional to the rate of fluid flow;

a by-pass tube connected across the said constriction through which some of the aforementioned fluid flows at a rate proportional to the differential pressure;

a thermal shunt having first and second ends and a relatively high thermal conductivity;

a heat exchanger for facilitating the transfer of heat between fluid flowing within the said by-pass tube and the first end of the said thermal shunt, the said heat exchanger and thermal shunt being otherwise thermally isolated from the fluid within the said conduit;

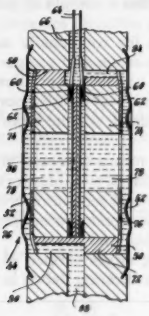
a heat sink for maintaining the second end of the said thermal shunt at a reference temperature; means for measuring the temperature differential across at least a portion of the said thermal shunt; and

means for indicating the heat flow through the said conduit as a function of the said measured temperature differential.

4,085,614
VORTEX FLOW METER TRANSDUCER

John R. Curran, Attleboro; George E. Sgourakes, Millis, and David A. Richardson, Sheldonville, all of Mass., assignors to The Foxboro Company, Foxboro, Mass.

Continuation of Ser. No. 463,301, Apr. 23, 1974, abandoned.
This application Dec. 11, 1975, Ser. No. 639,776
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 VS 11 Claims



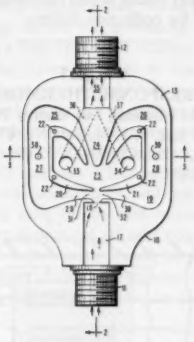
1. Flow-metering apparatus of the vortex-shedding type comprising:
a flow-pipe section adapted to be coupled into a flow system;
a vortex-generating body mounted in said flow pipe section;
means defining an enclosed chamber downstream of said body including flexible diaphragm means as one wall of said chamber arranged to respond to the pressure fluctuations of vortices shed from said body and to transmit such pressure fluctuations into the interior of said chamber;
sensor means located outside of said flow-pipe section, remote from the process fluid flowing through the associated flow system;
said sensor means comprising an enclosed compartment;
a pressure-responsive piezo-electric sensor element in said compartment;
the area of said sensor element being about 2.5 times the area of said diaphragm means;
conduit means connecting said compartment with said enclosed chamber; and
liquid filling in said conduit means, said chamber, and said compartment, to transmit vortex pressure pulses from said flexible diaphragm means to said piezo-electric sensor element to produce a pulsating flow signal corresponding to the fluid flow rate.

4,085,615
LINEAR FLOWMETER

Kenneth B. Haefner, Schenectady, and Carl G. Ringwall, Scotia, both of N.Y., assignors to General Electric Company, Wilmington, Mass.

Filed Nov. 22, 1976, Ser. No. 743,907
Int. Cl.[2] G01F *1/32*
U.S. Cl. 73—194 B 8 Claims

1. A flowmeter of the fluid oscillator type comprising:
(a) a proportional fluid amplifier having an interaction chamber, fluid accelerating means receiving at least a portion of the fluid, the flow rate of which is to be measured for forming a fluid jet directed into the chamber,
(b) receiver means disposed on opposite sides of the jet to receive a differentially variable portion of the jet fluid,
(c) conduit means forming control ports for laterally deflecting the jet with respect to the receiver means,
(d) feedback conduit means interconnecting the receiver means and control ports of the amplifier to establish the differential pressure to deflect said jet whereby the amplifier is caused to oscillate continuously at a frequency variable in accordance with the flow rate of the fluid passing through the fluid accelerating means,
(e) flow rate indicating means sensing the jet oscillation frequency,

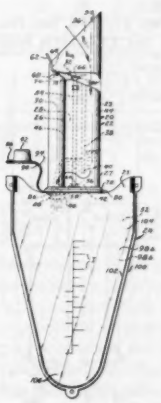


(f) said fluid accelerating means being in the form of a sharp-edged orifice having an aspect ratio which provides a predetermined constant orifice discharge coefficient whereby the flow vs. frequency characteristic of said flowmeter is linear for Reynold's numbers in the range from 200 to 50,000.

4,085,616
LIQUID MEASURING AND COLLECTION DEVICE

Bhupendra C. Patel, Elgin, and Steven M. Boedecker, McHenry, both of Ill., assignors to The Kendall Company, Boston, Mass.

Continuation of Ser. No. 524,021, Nov. 15, 1974, abandoned.
This application Mar. 10, 1976, Ser. No. 665,666
Int. Cl.[2] G01F *1/00, 23/00*
U.S. Cl. 73—215 25 Claims



2. A device to receive a discharge of urine, comprising:
a receptacle having a cavity to receive and measure the discharge, a transverse lower wall having a lower surface and defining a lower part of said cavity, a hollow extension depending below said lower wall and defining port means to direct passage of urine from the receptacle, and means for measuring a characteristic of said discharge associated with flow of the discharge in said cavity; and
a container having a chamber, a relatively rigid transverse upper wall for placement in closely spaced facing relationship adjacent said lower surface of said lower wall and having opening means to receive said extension, and

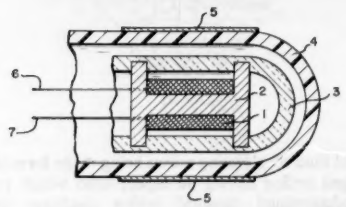
means for releasably attaching the container directly to the receptacle and for supporting the container from the receptacle with the extension received through the opening means into said chamber, whereby urine is directed through the port means in said extension to the chamber of the container for collection therein.

4,085,617

FAST RESPONSE THERMOMETER

Edwin Langberg, 33 Manning La., Cherry Hill, N.J. 08003

Filed Apr. 5, 1976, Ser. No. 673,806
Int. Cl.[2] G01K *7/38*
U.S. Cl. 73—362 CP **3 Claims**



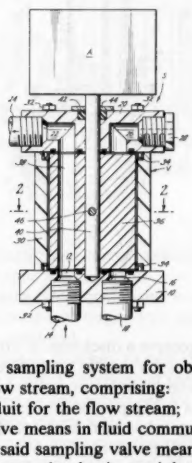
1. A thermometer probe comprising: means for generating an electromagnetic field; a housing for said means for generating an electromagnetic field; a temperature sensing material which forms a magnetic path with said electromagnetic field; said temperature sensing material disposed on a thermally and electrically insulating removable, disposable sheath fitted over said housing.

4,085,618

COMPOSITE SAMPLING SYSTEM AND ROTATABLE SAMPLING VALVE THEREFOR

Henry R. Collins, Jr., Livingston, Tex., assignor to Collins Products Company

Filed Oct. 27, 1976, Ser. No. 736,259
Int. Cl.[2] G01N *1/20*
U.S. Cl. 73—422 TC **6 Claims**



1. A composite sampling system for obtaining composite samples from a flow stream, comprising:

(a) an inlet conduit for the flow stream;

(b) sampling valve means in fluid communication with said inlet conduit, said sampling valve means comprising:

(1) a base plate member having an inlet port for receiving fluid from said inlet conduit;

(2) a cap plate member having an outlet port for transferring fluid from said sampling valve means;

(3) a transfer port for transferring samples obtained by said sampling valve means;

(4) a sampling body member mounted between said base plate member and said cap plate member;

(5) said sampling body member having a sample receiving tube formed therein;

(6) said sample receiving tube having a fixed size to receive a predetermined volume of the flow stream therein; and

(7) said sample receiving tube being normally aligned in a first position between said inlet port and said outlet port for flow of the flow stream therethrough in order to continually retain a sample of predetermined volume therein;

(c) actuator means for rotationally moving said sampling body member to move said sample receiving tube from said first position to a second position aligning said sample receiving tube with said transfer port to transfer the sample of predetermined volume from said sampling valve means; and

(d) shearing insert means mounted in said sampling valve means in at least one of said inlet port, said outlet port, said transfer port and said sample receiving tube for shearing debris in the flow stream during movement of said sampling body member; and

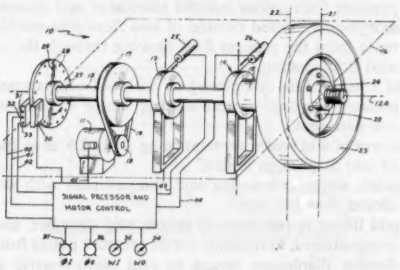
(e) inclined cutting edges formed in said shearing insert means to assist in shearing debris in the flow stream.

4,085,619

ELECTRONIC BALANCER FOR VEHICLE WHEELS

Haskell Shapiro, Corona del Mar, and Robert E. DeCaro, Tustin, both of Calif., assignors to Royal Industries, Inc., Osseo, Minn.

Filed Feb. 9, 1976, Ser. No. 656,606
Int. Cl.[2] G01M *1/08*
U.S. Cl. 73—462 **30 Claims**



1. Electronic wheel balancing apparatus comprising in combination:

(a) a shaft for rotatably mounting a wheel and tire;

(b) reversible motor means driveably connected to said shaft;

(c) control means for energizing said motor from a source of energy;

(d) first and second bearing means rotatably journaling said shaft, said bearing means having mounting means permitting motion thereof in parallel planes,

(e) first and second sources of signal connected to said first and second bearing means, said first and second sources of signal being indicative of the velocity of motion of the respective bearing means;

(f) third and fourth sources of signal, said third source of signal being indicative of the angular position of said shaft and the direction of rotation of said shaft, and said fourth source of signal being indicative of the rotational velocity of said shaft;

(g) signal responsive means connected to said first and second signals to indicate the magnitude of an imbalance in each of said planes and connected to said third signal to indicate the angular location of an imbalance in each of said planes;

(h) means connecting said sources of signal to said control means whereby said motor means is energized to attain a predetermined rotational velocity, the first and second signals are displayed on said signal responsive means to indicate the magnitude of imbalance in each of said planes, the third signal is displayed on said signal responsive means for indicating the angular location of the imbalance in each of said planes;

(i) means to energize said motor means in a reverse direction to thereby tend to stop said shaft; and,

(j) means to de-energize said motor when the positional source of signal reverses direction allowing said shaft to remain at rest.

4,085,620

PRESSURE-ELECTRIC TRANSDUCERS

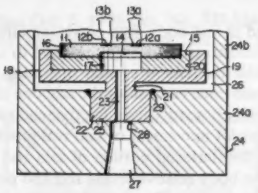
Akio Tanaka, Kodaira, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sep. 28, 1976, Ser. No. 727,536

Claims priority, application Japan, Sep. 30, 1975, 50-117902; Sep. 30, 1975, 50-117903; Apr. 16, 1976, 51-43406; Nov. 17, 1975, 50-155187[U]

Int. Cl.[2] G01L *9/04*

U.S. Cl. 73—727 **9 Claims**



1. A pressure-electric transducer comprising a substrate having an opening for receiving pressure transmitting fluid; a stress absorbing member having a connecting section provided with a fluid passage communicated with said opening and secured to said substrate, a neck section connected to the connecting section and having a diameter not larger than that of the connection section and a head section connected to the neck section and having a diameter larger than that of said neck section, said neck and said head sections being integral with said connecting section; a semiconductor pressure sensitive element mounted on the head section of said stress absorbing member with the pressure receiving surface of said pressure sensitive element disposed to close said fluid passage, said stress absorbing member having substantially the same linear expansion coefficient as said semiconductor pressure sensitive element; and means for deriving from said semiconductor pressure sensitive element an electric signal corresponding to the pressure of said pressure transmitting fluid, a detection casing containing said semiconductor pressure sensitive element, a temperature compensator contained in said detection casing and electrically connected to said pressure sensitive element, an amplifier casing removably connected to said detection casing, and an amplifier contained in said amplifier casing for amplifying said derived electric signal.

4,085,621

TRAVERSING MECHANISM

Bernard Milton Hadaway, Melbourne, Australia, assignor to Repco Research Proprietary Limited, Dandenong, Australia

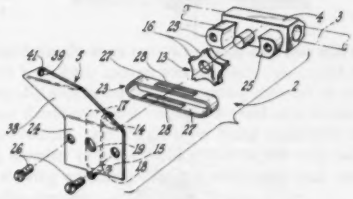
Filed Jul. 26, 1976, Ser. No. 708,355

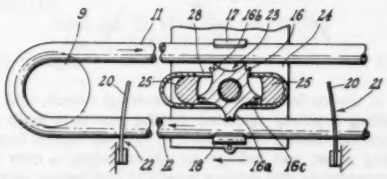
Claims priority, application Australia, Aug. 4, 1975, 2626/75

Int. Cl.[2] F16H *19/06*

U.S. Cl. 74—37 **6 Claims**

1. A traversing mechanism including: a carriage; guide means slidably supporting said carriage for movement along a predetermined path; drive means including an endless belt arranged so that each of two runs of the belt are located on opposite sides respectively of the carriage and extend generally parallel to said path, and power means operatively connected to said belt to cause rotation thereof in one direction; a drive coupling mounted on said carriage for movement therewith and being operative to engage either one of said belt runs so as to lock said carriage thereto for movement with that run, said coupling including a single rotatable element having a plurality of radially projecting lobes arranged so that in one rotational position of said element one of said lobes engages one of said belt runs to effect said lock, and in another rotational position of said element another of said lobes engages the other of said belt runs to effect said lock, said lobe arrangement being such that only one of said belt runs is locked to said carriage in any one of said rotational positions of said coupling element; an escapement slidably mounted on said carriage for movement independent of the movement of said coupling element between two operative positions, in each of which said escapement prevents rotation of the coupling element in the direction in which it is influenced by the particular belt run with which





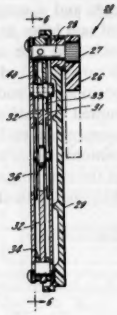
it engages; and stop means located in the path of travel of said carriage at each of two positions spaced apart along that path, each being operative to cause movement of said escapement from one said operative position to another as said carriage approaches the respective stop means, and to thereafter present a barrier to further travel of said carriage towards that stop means; said escapement being operative during each said change of operative position to free said coupling element for limited rotation only in the direction of movement of the engaged belt run, which is sufficient to advance said coupling element from one said rotational position to another; whereby as said stop means presents a barrier to said carriage, continuing movement of the belt run locked to said carriage causes said coupling element to rotate in the direction of said belt run movement to adopt a rotational position in which a said lobe thereof engages the other said belt run so that said carriage is moved in the direction opposite to said one direction, and movement of said coupling element beyond that new rotational position is prevented by said escapement until there is a further change of the escapement operative position.

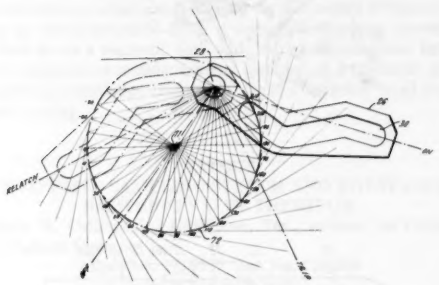
4,085,622

ELECTRICAL OPERATOR FOR CIRCUIT BREAKERS

Carl E. Gryctko, Haddon Heights, N.J.; Anthony B. Michetti, Warminster, and Peter J. McGinnis, Chester Township, Delaware County both of Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Dec. 4, 1973, Ser. No. 421,536
Int. Cl.[2] F16H *25/08*
U.S. Cl. 74—53 9 Claims





1. A device for operating an electrical switch, said device including a power operated driving means, a main output element operatively connectable to a circuit breaker handle for moving same; and linkage means, including a cam means, interconnecting said driving means to said output element to obtain a mechanical advantage at said output element that varies for different positions thereof generally in relation to force required to operate said output element at each of said different positions; said linkage means including first and second arms extending between said driving means and said output element; said cam means providing a driving connection between said arms; said cam means including means defining a longitudinally extending cam formation on said second arm and follower means at a fixed location on said first arm in operative engagement with said cam formation.

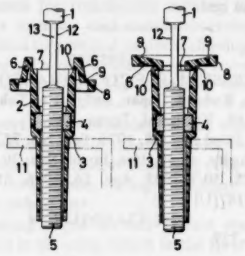
4,085,623

DEVICE FOR ADJUSTING LENGTH OF ROD

Takuo Yuda, Yokohama, Japan, assignor to NIFCO Inc., Tokyo, Japan

Filed Apr. 16, 1976, Ser. No. 677,658
Claims priority, application Japan, Apr. 18, 1975, 50-51950[U]
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.15 6 Claims

1. A one-piece plastic device adapted for adjustment of a rod having a screw threaded free end portion and a flattened portion adjacent thereto, said device including a substantially cylindrical open-ended body portion, female threaded means positioned internally and intermediate the extremities of said body and adapted to cooperate with said threaded portion of said rod, enlarged cavity means positioned and extending between said female threaded means and one end of said body, locking means including a pair of freely swingable pawls disposed opposite each other at the open cavity end of said body with each said pawl being integrally connected adjacent one end to the free end edge of said body by a flexible hinge and each said pawl being connected by a flexible hinge at their opposite end to the inner edge of an annular operating member, said member encircling said body in spaced relation adjacent



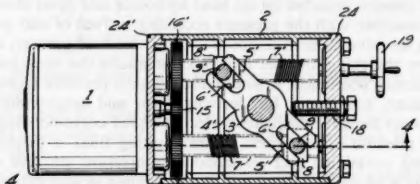
the cavity end of said body, said pawls initially being disposed in an open unobstructing position relative to said open cavity end while axial movement of said operating member in the direction of said open end causes the said one end of said pawls to swing radially inwardly over the free end edge of said body to thereby restrict movement of said rod relative to said body by engaging the flattened portion of said rod and preventing rotation of the body relative to the rod and positioning means located on the exterior of intermediate the extremities of said body.

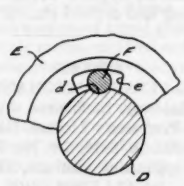
4,085,624

ELECTRICALLY DRIVEN ACTUATOR

Chifuru Nomura, Chino, Japan, assignor to Kitazawa Shoji Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 669,890
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.15 16 Claims





1. An electrically driven actuator comprising a housing portion including means by which the actuator is connected to a driven apparatus, a pair of threaded shafts arranged in paral-

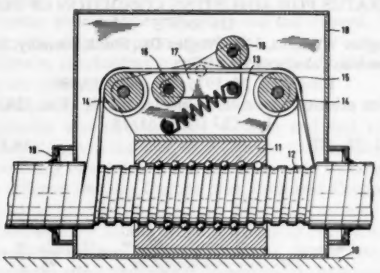
lel to each other in a plane extending transversely of a rotary shaft which has at least one end adapted to be associated with a valve stem to be actuated, said pair of threaded shafts being located symmetrically with respect to said rotary shaft, operating means adapted to convert rotation of said pair of threaded shafts into rotation of said rotary shaft, and a rotary drive source comprising an electric motor adapted to drive said pair of threaded shafts, wherein at least one of said pair of threaded shafts is associated in a section for drive transmission from said rotary drive source with a mechanism adapted to adjust, absorb and combine any relative phasal shift between both threaded shafts, and said mechanism for adjustment of the phasal shift between the pair of threaded shafts comprises a wide groove formed in a wheel adapted to be engaged with an associated threaded shaft along an engaging opening in said wheel, said groove having a constant depth from the surface of the associated threaded shaft, and a pin adapted to be urged into a gap defined by the associated threaded shaft surface and said groove after an angular position relative to a predetermined position on the shaft side has been adjusted.

4,085,625

PROTECTIVE DEVICES FOR THREADED DRIVE SHAFTS

Werner Jung, Friedhof strasse 21, D-4050 Monchengladbach, Germany

Filed Oct. 5, 1976, Ser. No. 729,824
Claims priority, application Germany, Oct. 21, 1975, 2546988
Int. Cl.[2] F16H *27/02*
U.S. Cl. 74—89.22 **10 Claims**



1. A protective device for a threaded shaft driven machine having relatively fixed and movable parts with a threaded shaft extending therebetween and connected thereto in respective rotary and driving engagement, said device comprising a protective belt connected at at least one end to said shaft at a point adjacent said fixed machine part, said belt being wound around and completely enclosing and protecting said shaft excluding the portion of said shaft engaged by said movable machine part, rotary member means mounted on and movable with said movable machine part for supporting said protective belt, said protective belt extending away from said shaft at a point immediately adjacent the shaft engaging portion of said movable machine part and being passed around and supported by said rotary member means for take-up and pay-out to the shaft during rotation thereof dependent upon the direction of rotation.

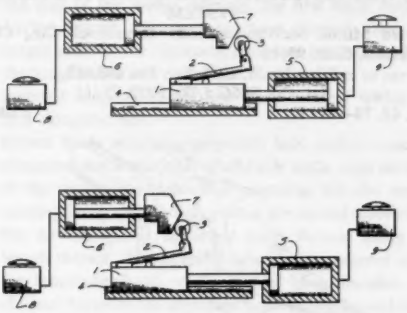
4,085,626

TWO HANDED MOMENTARY ACTUATOR

Fred F. Richards, 6837 Chevy Chase, Dallas, Tex. 75225

Filed Oct. 12, 1976, Ser. No. 731,208
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—110 **2 Claims**

1. In an actuating mechanism for an operator actuated device, the combination of two members movable between opposite positions, support means for mounting said members on said device, a cam member extending from the longitudinal axis of one movable member and aligned to travel parallel to a guide-way, a toggle-lever operated member extending from the longitudinal axis of a second movable member, said toggle-lever operated member being mounted to travel on said guide-way opposite the direction of travel of said cam member, said movable members having longitudinal axis parallel to each other and to said guide-way, said cam and said toggle-lever operated member being aligned and disposed to engage said



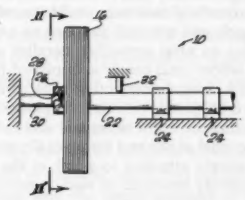
cam and said toggle-lever only when said cam and said toggle-lever have both been moved toward each other, said toggle-lever hingedly supported on an actuating member to move as a rigid unit therewith when engaged by said cam in one direction of movement, said toggle-lever being supported on said actuating member to pivot thereon and to ride over said cam without moving actuating member when said cam moves in the opposite direction.

4,085,627

ELLIPTICAL FLYWHEEL APPARATUS

Jon R. Losee, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 22, 1976, Ser. No. 707,583
Int. Cl.[2] F16F *15/10*; F16H *33/02*
U.S. Cl. 74—574 **4 Claims**



1. A flywheel apparatus comprising:
a pair of radially extending diametrically opposed spokes;
a rim mounted on said spokes;
said rim being elliptical with the major axis being substantially coextensive with the longitudinal axes of the spokes;
the difference in length between the major and minor axes being such that when the flywheel apparatus is at full speed the rim is substantially circular and contact is maintained between the rim and the spokes;
a shaft;
said spokes and rim being rigidly mounted on the shaft for unitary rotation;
the shaft extending from one side of the spokes;
means rotatably supporting only said extension of the shaft so that the spokes and rim are cantilevered for rotation;
a boss centrally mounted on the spokes on a side opposite said shaft;

said boss having an annular recess which is coextensive with the shaft; and

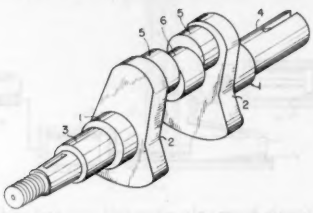
a cylinder mounted for extension within said recess and having a diameter which is smaller than the recess so that vibrations of the spokes and rim can be damped by contact of the cylinder and the boss within the recess.

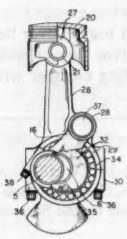
4,085,628

INTRA-ARTICULATE RECIPROCATING ENGINE SYSTEM

Edward Milton McWhorter, 6931 Greenbrook Cir., Citrus Heights, Calif. 95610

Filed Jun. 7, 1976, Ser. No. 693,682
Int. Cl.[2] G05G *1/00*; F02B *75/32*
U.S. Cl. 74—579 E **2 Claims**





1. A crankshaft comprising a plurality of longitudinally aligned and longitudinally spaced mainshafts having arms fixed on the adjacent ends of said mainshafts lateral crankpins projecting from each said arm and attached to a common central crankpin having an axial centerline parallel with said lateral crankpins but whose axial center is displaced from that of said lateral crankpins, lateral connecting rods rotatively mounted on said lateral crankpins at one end and pivotally attached to a central connecting rod at the other end said central connecting rod having a journal at one end for pivotally mounting a piston and being rotatively attached to a link at the other end, said link being rotatively mounted on said common central crankpin.

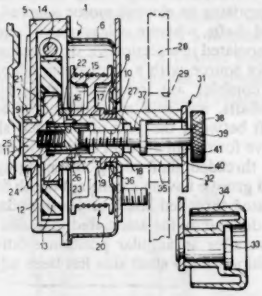
4,085,629

ELECTRIC WINDOW REGULATOR FOR MOTOR VEHICLES WITH MEANS FOR MANUAL EMERGENCY OPERATION

Pier Paolo Fogarollo, Chiavari (Genoa), Italy, assignor to LAMES Societa per Azioni, Chiavari (Genoa), Italy

Filed Jan. 25, 1977, Ser. No. 762,369
Int. Cl.[2] G05G *1/08*; E05F *15/00*
U.S. Cl. 74—625 **3 Claims**

1. An electric window regulator for motor vehicles, comprising a grooved drum upon which is wound a window operating cable, an electric motor drivingly connected to the drum through a reduction gear, the driven member of the reduction gear being disposed alongside the grooved drum, a coupling for connecting the drum torsionally to the said driven member, the said coupling having an axially movable member, loaded by resilient means so as normally to couple the driven member and the drum together, and an auxiliary handle for effecting manual emergency operation of the regulator, said handle being adapted to fit on to an outer end portion of the hub of the drum and having a threaded shank which is adapted to be



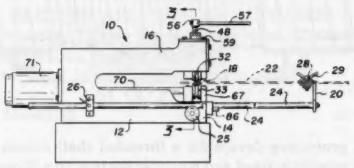
screwed into the said hub to displace the movable member of the coupling axially until it ceases to couple together the drum and the driven member of the reduction gear, thereby making possible manual operation of the drum by means of the said auxiliary handle.

4,085,630

APPARATUS FOR ADJUSTING CONDITION OF METAL OF SAWS

Christopher Williams, 5490 Forglen Dr., South Burnaby, British Columbia, Canada (V5H 3K7)

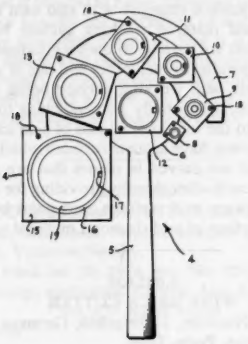
Filed Aug. 26, 1976, Ser. No. 717,937
Claims priority, application Canada, Jun. 8, 1976, 254343
Int. Cl.[2] B23D *63/18*
U.S. Cl. 76—27 **14 Claims**



1. Apparatus for adjusting the condition of the metal of saws, comprising support means for supporting a saw for movement in the plane of the saw, a first roll positioned to engage one face of the supported saw and to roll over said one face, said first roll having a peripheral surface slightly curved in cross section, a second roll positioned to engage an opposite face of the supported saw in opposition to the first roll and to roll over said opposite face in the same direction as the first roll, said rolls being rotatable on substantially parallel axes and said axes being parallel to the plane of the saw on said support means, said second roll having an annular groove in the periphery thereof dividing said periphery into two annular roll sections of the same diameter, the peripheral surfaces of said roll sections being parallel to said saw plane, the peripheral surfaces of said first roll and each of said roll sections being slightly curved in cross section, pressure means for moving one of said rolls towards the other of said rolls to cause the rolls to grip the saw therebetween, shifting means connected to one of said rolls for changing the relative position axially of the first roll and the second roll selectively to locate the peripheral surface of the first roll opposed to any portion of the peripheral surface of either of the annular roll sections and of said annular groove,

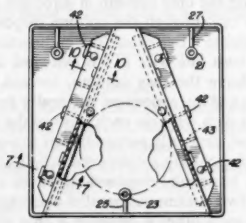
and power means connected to one of said rolls operable to rotate the latter roll.

4,085,631
CANNON PLUG WRENCH
Gerard D. Bellerose, 94-820 Awanei St. #8, Waipahu, Hi. 96797
Filed Mar. 24, 1977, Ser. No. 780,721
Int. Cl.[2] B25B *13/48*
U.S. Cl. 81—3 R **1 Claim**



1. A Cannon plug wrench comprising
a handle,
a circular plate member affixed to one end thereof,
a crescent shaped support member,
a Cannon plugholding member mounted on said circular plate member, and
a multiplicity of Cannon plug holding members mounted between said circular plate member and said crescent shaped support member, each Cannon plug holding member being of a different size and adapted to accommodate a different discrete Cannon plug, each said Cannon plug holding member comprising a base plate member and a short segment hollow cylindrical member perpendicularly mounted thereon, the inner diameter thereof being substantially equal to the outer diameter of the base portion of a given Cannon plug and having a protruding key ridge thereon, said key ridge being configured and oriented to mate with a keyway in the base of said Cannon plug.

4,085,632
SCREW CAP OPENER
Jesse M. Hogan, and Violet L. Hogan, both of Vivian, La., assignors to Kap-Key, Inc., Vivian, La.
Filed Jan. 4, 1977, Ser. No. 759,588
Int. Cl.[2] B67B *7/36*
U.S. Cl. 81—3.3 R **4 Claims**

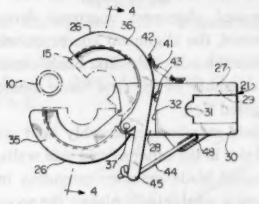


1. In an opener for containers having screw caps thereon, the opener having opposing body portions which have facing planar side walls disposed at an angle to each other to form a V-shaped wedge opening for receiving screw caps of varying dimensions, the improvement comprising:
a first blade member replaceably held within a first elongated slot in one of said side walls, the first blade member having angled tooth-like projections extending therefrom into the wedge opening, the first blade member being disposed in said slot with the projections facing toward the rear of the wedge opening, the first blade member having spaced alignment apertures formed along the length thereof, the alignment apertures being offset from the longitudinal axis of the first blade member to prevent inverted assembly of the first blade member within the first elongated slot;
a second blade member replaceably held within a second elongated slot in the other of said side walls, edge surfaces of the second blade member extending into the wedge opening being substantially planar, the second blade member having spaced alignment holes formed along the length thereof, the alignment holes being centered along the longitudinal axis of the second blade member, the distance between the alignment holes in said second blade member being different from the distance between the alignment apertures in said first blade member;
alignment ridges formed on the respective body portions of the opener and spaced from the respective side walls for abutting edge portions of the respective first and second blade members to locate said blade members in a predetermined relation to the slots in said side walls;
support ridges formed on the respective body portions of the opener between the alignment ridges and the respective slots, the support ridges being of a height less than the alignment ridges and abutting the respective blade members along planar surfaces thereof to support said blade members, distal surface portions of the support ridges being aligned with edge portions of the slots nearest to surfaces of the body portions from which the support ridges extend; and,
mounting pins formed on the respective body portions of the opener between the alignment ridges and the respective slots, upper portions of each of the mounting pins opposite the first slot being received within the alignment apertures formed in the first blade member, upper portions of each of the mounting pins opposite the second slot being received within the alignment holes formed in the second blade member, the upper portions of the mounting pins being reduced in diameter relative to the lower portions of said mounting pins, the upper portions of said mounting pins snap-fitting into the alignment apertures and alignment holes respectively, planar surfaces of the blade members abutting and being supported by substantially planar shoulder portions of the lower portions of the mounting pins, the mounting pins received within the alignment apertures of the first blade member being spaced apart a distance equal to the spacing of said alignment apertures, the mounting pins received within the alignment holes of the second blade member being spaced apart a distance equal to the spacing of said alignment holes, the spacing of the mounting pins and alignment apertures and holes preventing accidental interchange of the blade members on assembly or replacement of said blade members, the opposing edge surfaces of the first and second blade members gripping a screw cap on insertion of a container within the wedge opening to facilitate removal of the screw cap from the container.

4,085,633
SPRINKLER ADJUSTOR AND ESCUTCHEON APPLICATOR TOOL

Jimmy Jackson, 4360 Vinson Ave., Macon, Ga. 31206, and William D. Roquemore, Rte. 1, Box 171B, Musella, Ga. 31066

Filed Jan. 12, 1977, Ser. No. 758,748
Int. Cl.[2] B25B *13/28*
U.S. Cl. 81—111 13 Claims

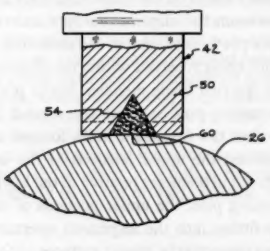


1. A combination wrench and clamping tool comprising a tool head mounted on one end of an elongated tool handle means, said tool head having a wrench means and a clamping means disposed in a generally opposing relationship, said clamping means having a pair of arcuately shaped tong means, said tong means including means for supporting a pivoted fixture member, at least one of said tong means being movable between an open and closed position relative to the other of said tong means, and remotely controlled operating means for moving said movable tong means into a closing relationship with the other of said tong means, whereby a pivoted fixture member received by said clamping means will be closed as said tongs are moved into said closing relationship.

4,085,634
CAM AND CAM FOLLOWER ASSEMBLY

Robert I. Sattler, Grosse Pointe Shores, Mich., assignor to LaSalle Machine Tool, Inc., Warren, Mich.

Filed Jun. 13, 1974, Ser. No. 479,046
Int. Cl.[2] B23B *3/28;* F16H *53/06*
U.S. Cl. 82—19 3 Claims



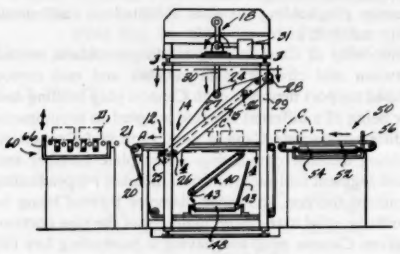
1. In apparatus which includes a substantially cylindrical cam having a longitudinal axis and a cam follower engaged with and movable longitudinally of said cam, said cam follower comprising a body having a cavity at one end and a diamond material filling said cavity and having an arcuate working surface, said working surface being curved solely in planes parallel to the longitudinal axis of said cam and to each other and one of which planes intersects said axis, said working surface being substantially straight in a plane substantially perpendicular to said planes that are parallel to the longitudinal axis of said cam, whereby said cam and follower have arcuate surfaces which are tangent to each other and are curved in planes that are substantially perpendicular to each other thereby providing for substantially point contact between said surfaces, said point being located on said working surface.

3. In a piston turning machine, elongated rotatable shaft means having an axis, means for supporting a piston to be turned on one end of said shaft means, a cam member intermediate the ends of said shaft means, said cam member having an external surface curved about said axis, a support bar mounted for movement substantially parallel to said axis, a turning tool secured to said bar and extending toward said axis for engagement with a piston on said support means, a cam follower secured to said bar and engaged with said cam member, means urging said follower into engagement with said cam member, said cam follower comprising a body having a cavity at one end and a diamond material filling said cavity and having an arcuate working surface engaged with said cam member surface, said diamond material working surface being curved solely in planes that are parallel to the longitudinal axis of said cam and are also parallel to each other and one of which planes intersects said axis, said working surface being substantially straight in a plane substantially perpendicular to said planes that are parallel to the longitudinal axis of said cam, whereby said cam and follower have arcuate surfaces which are tangent to each other and are curved in planes that are substantially perpendicular to each other thereby providing for substantially point contact between said surfaces, said point being located on the arcuate surface of said diamond material.

4,085,635
WIRE BRICK CUTTER

Hans Lingl, Sr., Neu-Ulm, Ludwigsfeld, Germany, assignor to Lingl Corporation, Paris, Tenn.

Filed Oct. 8, 1976, Ser. No. 731,096
Claims priority, application Germany, Feb. 27, 1976, 2608041
Int. Cl.[2] B28B *11/14;* B26D *1/10*
U.S. Cl. 83—13 10 Claims



1. A method for cutting clay columns comprising the steps of

a. moving a clay column in a given generally horizontal direction A,

b. disposing at least one cutting wire in a generally vertical plane at a fixed angle of substantially less than 90° with respect to said direction A,

c. reciprocating the at least one cutting wire from a position out of contact with the clay column toward, into engagement with, and through the clay column while continuously moving the clay column in direction A, to provide at least one cut through the column disposed in a plane that is parallel to a line extending in direction A, by moving said at least one wire in a downward direction from generally above the clay column, toward, into engagement with, and to a position generally below the clay column, in a path wherein each point of the wire moves in a straight line, generally perpendicular to said direction A.

6. Apparatus for cutting a conveyed article comprising

a. a generally horizontal disposed conveyor system including at least two continuous parallel conveyor belts spaced apart from each other a distance X in a direction transverse to the direction A in which articles disposed on said conveyor belts are conveyed,

b. means for mounting at least one cutting wire so that it extends in a generally vertical plane and is disposed at a fixed angle of substantially less than 90° with respect to

said direction A, and so that it passes through the space between said conveyor belts, said at least one cutting wire having a horizontal dimension less than X,

c. means for powering said conveyor belts for movement of articles disposed thereon in said direction A,

d. means for moving said at least one cutting wire mounting means so that at least one cutting wire moves from a position above an article downwardly toward and into engagement with and through an article continuously being moved by said conveyor belts in said direction A to provide at least one cut through the article disposed in a plane that is parallel to a line extending in direction A, and

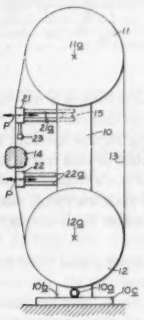
e. means for guiding the movement of said at least one cutting wire mounting means so that it is reciprocal, each point of said at least one cutting wire moving in a straight line, generally perpendicular to said direction A, during movement of said at least one cutting wire toward, into engagement with, and through an article on said conveyor belts.

4,085,636

METHOD AND MACHINE FOR BAND SAWING

Urban Eklund, Soderhamn, Sweden, assignor to Kockums Automation AB, Vasteras, Sweden

Filed Jul. 29, 1976, Ser. No. 709,852
Claims priority, application Sweden, Aug. 5, 1975, 7508801
Int. Cl.[2] B27B *13/10*
U.S. Cl. 83—56 **3 Claims**



1. In a method of continuously preserving the correct line of cut on a band sawing machine including an endless saw blade having a cutting edge and being entrained over two saw pulleys and a pair of blade guides and a means for sensing the lateral position of the saw blade, the steps of: continuously sensing for an lateral displacement of the saw blade during sawing from the correct line of cut and countering the adverse effect of such a lateral displacement by generating a corrective movement involving a lateral displacement in the opposite sense of the cutting edge of the saw blade through a lateral movement of at least one blade guide in the said opposite sense relative to the correct line of cut, the corrective movement of the blade guide being carried out as a rectilinear lateral displacement.

4,085,637

APPARATUS FOR CUTTING SCRAP STRIP

Walter L. Michaels, Unionville, Conn., assignor to Plainville Special Tool, Inc., Plainville, Conn.

Filed May 10, 1976, Ser. No. 685,110
Int. Cl.[2] B26D *5/26*
U.S. Cl. 83—69 **8 Claims**

1. A portable apparatus for cutting into lengths scrap strip received from a press or the like and adapted to be positioned in line or at an angle to the scrap strip comprising:

A. a support providing a bed:

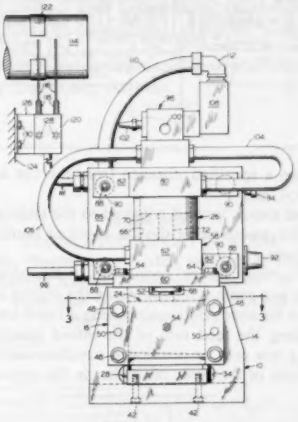
B. piston means mounted on said support for reciprocal movement of a piston toward and away from said bed, said piston having an exposed portion at its end adjacent said bed:

C. a cutting member on said exposed portion of said piston;

D. a die member on said bed cooperating with said cutting member to cut scrap strip being fed along said bed intermediate said cutting and die members:

E. a pressurized fluid inlet adapted to be connected to a source of pressurized fluid;

F. valve means connected to said pressurized fluid inlet and to said piston means to effect said reciprocal movement of said piston by controlling flow of pressurized fluid from said source, said valve means having a first operating position wherein said piston is moved toward said bed and a second operating position wherein said piston is moved away from said bed; and



G. electrical control means connected in circuit relation with said valve means and including probe means adapted to be mounted adjacent to a rotating shaft of a press or the like providing scrap strip for intermittent electrical contact with said shaft occasioned by rotation thereof, said control means including presetting means operable for presetting the interval between successive movements, as defined hereinbelow, of said valve means, said control means being responsive to periodic movement of the press for a preset interval to cause said valve means to move to said first operating position thereof whereby said piston is actuated by said pressurized fluid and said cutting member is driven toward said die member to cut scrap strip therebetween, said control means moving said valve means to said second operating position thereof following said actuation of said piston whereby said cutting member is moved away from said die member.

4,085,638

APPARATUS FOR CUTTING LUMBER TO VARIABLE CLEAR LENGTHS

James T. Fifer, 791 N. Shore Rd., Lake Oswego, Oreg. 97034

Filed Nov. 10, 1976, Ser. No. 740,532
Int. Cl.[2] B27B *5/00*
U.S. Cl. 83—71 **8 Claims**

1. An apparatus for cutting lumber to variable clear lengths comprising:

a. infeed means configured for supporting and transporting a piece of lumber longitudinally,

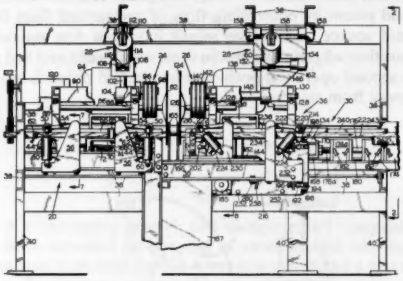
b. at least one fixed saw located above the downstream and of the infeed means in a manner for cutting a piece of lumber transversely at a first position,

c. at least one sliding saw located adjacent to the fixed saw

and movable longitudinally with respect thereto for cutting the piece of lumber transversely at a second position a spaced distance from the first position,

d. saw actuation means connected to the fixed and sliding saws and configured for actuating them between cutting positions for cutting a piece of lumber, and clear positions out of contact with the piece of lumber,

e. saw positioning means joined to the sliding saw and configured for positioning the sliding saw longitudinally with respect to the fixed saw for spacing the cut at the first



position a specified distance from the cut at the second position, and

f. outfeed means located adjacent to the sliding saw configured for transporting the cut piece of lumber out of the apparatus,

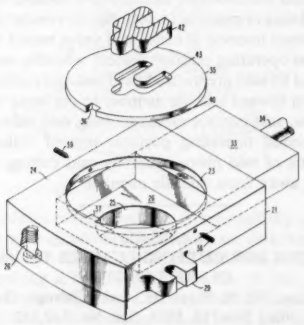
g. said outfeed means connected to the saw positioning means in a manner for following the sliding saw at a close spaced distance while maintaining a lineal transport speed matching the feed rate of the infeed means so that the sliding saw may be positioned simultaneously with transportation of the piece of lumber in the apparatus.

4,085,639

BLANKING DIE AND HOLDER CONSTRUCTION FOR PUNCH PRESSES

Joseph Marconi, 428 Jensen Rd., Vestal, N.Y. 13850

Division of Ser. No. 564,658, Apr. 3, 1975, Pat. No. 3,965,784.
This application Feb. 23, 1976, Ser. No. 660,271
Int. Cl.[2] B26D *7/18*
U.S. Cl. 83—157 **1 Claim**



1. A blanking die holder for supporting a relatively thin die plate into which a punch of a press forces material during blanking of parts blanks, said die holder comprising:

a housing including a bottom and upstanding walls, said walls defining a circular opening which receives and supports said thin die plate, said wall having an inwardly extending lip and inwardly extending set screws, said lip and set screws extending into said circular opening to engage a radially inwardly extended cutout and circumferentially spaced indentations, respectively on said die plate which is disk shaped;

a slidable support block, said support block being cyclically movable into a space within said housing defined by said die plate, walls, and bottom, said support block underlying said thin die plate to support said die plate during blanking of the parts; and

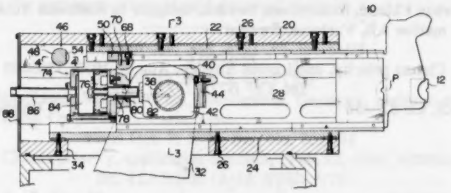
an opening in the bottom of said housing to allow gravitational removal of the parts blanks upon the movement of said support block out of said space under said die plate.

4,085,640

APPARATUS FOR SHEARING WIRE, ROD, OR THE LIKE

Takashi Furuto, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 21, 1977, Ser. No. 779,564
Claims priority, application Japan, Mar. 19, 1976, 51-29308
Int. Cl.[2] B26D *3/16*
U.S. Cl. 83—198 **6 Claims**



1. In shearing apparatus having a movable and a fixed shear element, the combination thereof with:

frame means including means forming a slideway;

a slide slidably mounted in said frame means for reciprocating movement between a first and a second position along said slideway, said slide carrying said movable shear element for moving same with respect to said fixed shear element;

actuator means for moving said slide between said first and said second positions;

an abutment on said slide, said actuator means abutting on said abutment for exerting pressure therethrough on said slide while moving the latter from said first to said second position;

stop means for terminating the travel of said slide in said first position as said slide is moved back from said second position by said actuator means; and

resilient means through which said slide is moved from said second to said first position by said actuator means, said resilient means yielding, when said slide is moved to and stopped in said first position, to permit said actuator means to travel an additional distance in a direction away from said second position whereby a space is created between said actuator means and said abutment;

whereby said actuator means is permitted to travel back unloaded through said space before moving said slide from said first to said second position.

4,085,641

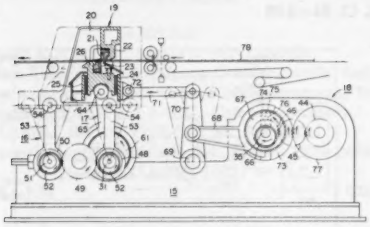
FLYING SHEAR MACHINE FOR CUTTING TRAVELING STOCK

Kunihiro Ito, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Dec. 29, 1976, Ser. No. 755,611
Claims priority, application Japan, Dec. 30, 1975, 50-158747; Dec. 30, 1975, 50-158748; Dec. 30, 1975, 50-158749
Int. Cl.[2] B26D *1/56*
U.S. Cl. 83—328 **5 Claims**

1. In a flying shear apparatus for cutting a traveling stock, employing a shiftable shear housing having upper and lower

knife holders in mutually opposed relation, one being stationary, the other being movable in a vertical direction, and supported by shifting support means enabling said shear housing to reciprocate in the traveling direction of said stock, shearing drive means for driving said movable knife holder in a reciprocal manner to cut said stock, and shifting drive means to drive the shiftable shear housing for reciprocation at a speed synchronized with the travel speed of the stock at the time of stock cutting, said shifting drive means defined by a driving main shaft rotating in a first direction, circular inner eccentric cam means affixed to said main shaft, circular outer eccentric cam means slidably fitted around said inner eccentric cam means and driven by drive shaft means in a second direction opposite to said first direction at the same rotational speed as said main shaft and said inner eccentric cam means, and a motion transmitting mechanism connected at one end to said shear housing and slidably fitted around said outer eccentric



cam means at the other end, for transmitting driving motion from said shifting drive means to said shear housing, said apparatus including: said shifting support means having parallel shafts, circular eccentric cams affixed to said parallel shafts, a pair of straps forming a parallel crank mechanism pivotally connected at one end to said shear housing and slidably fitted at the other end around said eccentric cams, and being further defined by driving means, first transmission means coupling said driving means to said main shaft and said outer eccentric cam drive shaft, second transmission means coupling said driving means to said parallel shafts, said first and second transmission means being operable to cause said parallel shafts and thereby said eccentric cams to rotate two revolutions per revolution of said main shaft, whereby a movement approximating a straight-line motion along the travel direction of said stock is imparted to said shiftable shear housing in at least a shearing interval of the forward stroke during the reciprocal motion thereof.

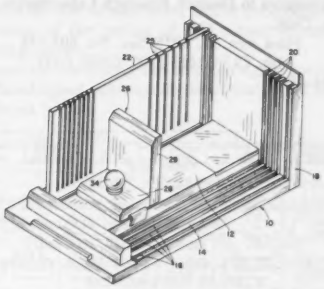
4,085,642

BREAD SLICING AND STORAGE CONTAINER

Thomas F. Birmingham, Beacon Bldg., Tulsa, Okla. 74103

Filed May 5, 1977, Ser. No. 794,250
Int. Cl.[2] B26D *4/50, 7/20*
U.S. Cl. 83—764 **4 Claims**

1. An apparatus for slicing bread, which comprises:
a base for supporting the loaf, having a plurality of spaced longitudinal grooves;
an end wall perpendicularly secured to one end of the base, having a plurality of longitudinal grooves aligned with the base grooves;
a first movable side member capable of being positioned in an aligned groove common to the base and end wall, having a plurality of knife guide slits;
a second movable side member capable of being positioned in an aligned groove common to the base end wall, having a plurality of knife guide slits; and



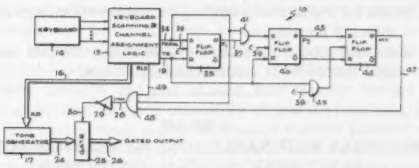
an adjustable end plate substantially parallel to the end wall, slidably mounted to the base.

4,085,643

TRUNCATED DECAY SYSTEM

Glen Griffith, Westminister, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 3, 1977, Ser. No. 773,980
Int. Cl.[2] G10H *1/00*
U.S. Cl. 84—1.01 **4 Claims**

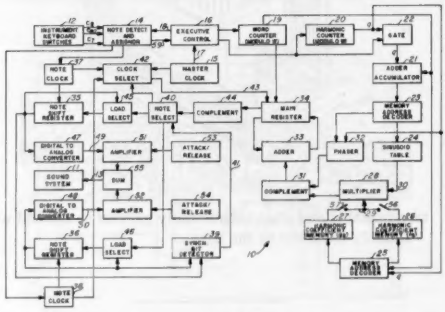


1. A truncated decay system for a time-shared electronic musical instrument of the type wherein selected keys are assigned to respective time slots in a repetitive timing interval, said instrument providing, at each such time slot, a keyboard signal designating the keyboard of the key assigned to that time slot, and a release signal indicating whether the corresponding key has been released so that the note is decaying, said truncated decay system being associated with a designated keyboard, comprising:
first bistable circuit means, reset at the beginning of each timing interval, connected to said musical instrument so as to be set during each timing interval by occurrence of the first keyboard signal corresponding to the designated keyboard,
second bistable circuit means, reset at the beginning of each timing interval, and connected to said first bistable circuit means so as to be set during each timing interval by occurrence of a second keyboard signal for the designated keyboard, and
inhibit means, responsive to setting of said second bistable circuit means and to said release signal and operative during the following timing interval, for inhibiting production of the note corresponding to each released assigned key of said designated keyboard when at least one key of said designated keyboard is still actuated, irrespective of whether all of the time slots currently have keys assigned to them.

4,085,644
POLYPHONIC TONE SYNTHESIZER

Ralph Deutsch, and Leslie J. Deutsch, both of Sherman Oaks, Calif., assignors to Deutsch Research Laboratories, Ltd., Los Angeles, Calif.

Filed Aug. 11, 1975, Ser. No. 603,776
Int. Cl.[2] G10H *1/00*; G10F *1/00*
U.S. Cl. 84—1.01 **36 Claims**

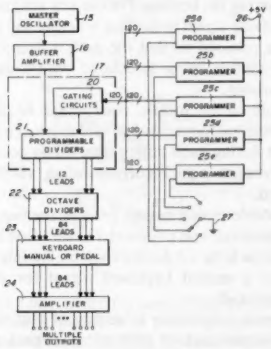


1. A musical instrument comprising;
means for computing a master data set during each computation cycle of a sequence of computation cycles,
a first memory means for writing said master data set to be thereafter read out,
a second memory means for writing input information to be thereafter read out,
means for reading said master data set from first memory means and writing master data set as input information in said second memory means,
means for repetitiously reading out information from second memory means, and
means for producing musical waveshapes from said read out information from second memory means.

4,085,645
INSTANTLY RETUNABLE TONE GENERATOR FOR AN ELECTRONIC MUSICAL INSTRUMENT

Donald Carroll Ryon, Carol Stream, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 29, 1976, Ser. No. 736,985
Int. Cl.[2] G10H *5/06*
U.S. Cl. 84—1.01 **8 Claims**

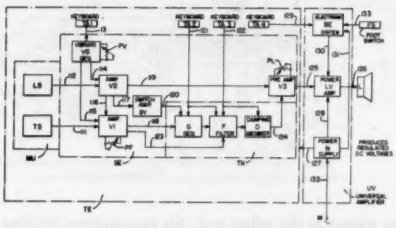


1. In a programmable tone generator for simultaneously providing a multiplicity of signal frequencies having a predetermined frequency relationship therebetween corresponding to one of a plurality of musical scales, a system for providing instant access to ones of a multiplicity of programs comprising:
a source of reference frequency;
DC programmable divider means coupled to the frequency source;
DC controlled switching means coupled to the divider means;
a source of DC potential for controlling said switching means;
a multiplicity of programming means coupled to the switching means for programming the divider means; and
manual switching means for selectively coupling the source of DC potential to one of the programming means.

4,085,646
ELECTRONIC MUSICAL INSTRUMENT

Klaus Naumann, Friedrich-Panzer-Weg 6 D-8000, Munich 83, Germany

Filed May 27, 1976, Ser. No. 690,557
Claims priority, application Germany, May 28, 1975, 2523623
Int. Cl.[2] G10H *3/02, 5/00*
U.S. Cl. 84—1.09 **49 Claims**



1. An electronic musical instrument providing continuous cybernetic tone finding controlled by the functions of the human mouth, comprising
a mouthpiece into which air is to be blown from the mouth of the player;
measuring means mounted at least in part of said mouthpiece for producing a pitch determining signal representing a measure of the mouth cavity of the player and a volume determining signal representing the velocity or pressure of the air blown into the mouthpiece;
tone generating means for generating a tone signal whose frequency varies with the level of a control signal applied thereto;
first control means responsive to said pitch determining signal for applying to said tone generating means a control signal having a level representing a measure of the mouth cavity of the player;
amplifier means having a variable amplification for amplifying the output of said tone generating means;
second control means responsive to said volume determining signal for varying the amplification of said amplifier means; and
means for converting the output of said amplifier means to sound.

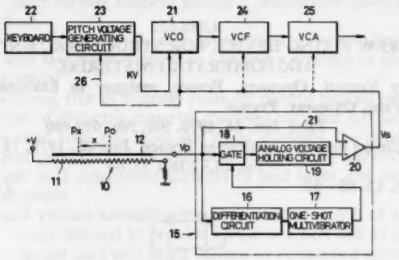
4,085,647
ELECTRONIC MUSICAL INSTRUMENT

Takeshi Adachi, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Feb. 22, 1977, Ser. No. 770,717
Claims priority, application Japan, Feb. 27, 1976, 51-21329
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **4 Claims**

1. An electronic musical instrument comprising:
actuator means actuated by a sliding operation for producing a voltage variable according to the actuated position thereof in each instant;
control signal generating means for producing a signal pro-

portional to a sliding distance in said actuator means responsive to the output voltage of said actuator means; and



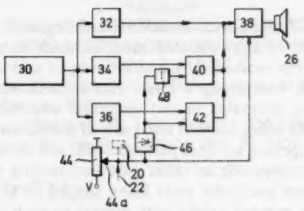
control means for controlling a musical tone element by the output signal of said control signal generating means.

4,085,648

ELECTRONIC SOUND SYNTHESIS

Jobst Fricke, Cologne, and Wolfgang Geiseler, Berlin, both of Germany, assignors to CMB Colonia Management-und Beratungsgesellschaft mbH & Co. K.G., Cologne, Germany

Filed Jun. 19, 1975, Ser. No. 588,486
Claims priority, application Germany, Jun. 21, 1974, 2429871
Int. Cl.[2] G10H *1/02*
U.S. Cl. 84—1.24 **7 Claims**



1. A system for producing electrical signals representing sounds of predetermined pitch and variable loudness value, wherein

signals for each sound of predetermined loudness value comprise component signals corresponding to partial tones of said sound, said component signals having frequencies above a fundamental frequency determing the pitch of the sound and forming a spectral amplitude/frequency pattern when the amplitudes are plotted as a function of their frequency, and including at least one formant region represented by a maximum in said amplitude/frequency pattern;

said spectral amplitude/frequency pattern determining the timbre of the sound;

signals representing sounds of different loudness values differing in the shape of the amplitude/frequency pattern of the component signals;

said system comprising

a signal source including means (**12**, **14**; **30**, **34**, **36**) providing at least first and second signal versions for each sound of predetermined pitch, said first and second signal versions having component signal forming different first and second spectral amplitude/frequency patterns corresponding to different first and second loudness values, respectively;

sound volume control means (**20**) for selecting a desired sound loudness value in a range between said first and second loudness values;

control means (**16**, **16*a*;** **18**, **18*a*;** **40**, **42**, **44*a***, **46**, **48**) connected to and controlled by the sound volume control means and further connected to the means (**12**, **14**; **30**, **34**, **36**) providing said signal versions for selecting a portion of said first signal version and a portion of said second signal version, the selection of the respective portions being controlled by said sound volume control means, for selecting the said sound loudness value and to vary said first and second portions inverse to each other and in accordance with the variations of the setting of said sound volume control selecting means;

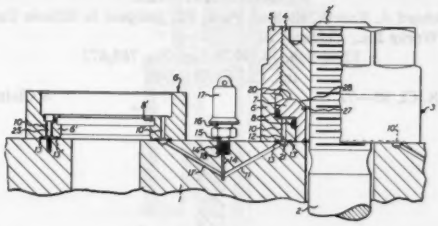
and means for combining said selected signal portions into a combined signal, which is the electrical sound signal to be produced.

4,085,649

BOLT ASSEMBLY

Nils Artur Christensson, Hamburg, Germany, assignor to Chris-Marin I Malmo AB, Malmo, Sweden

Filed Jan. 31, 1977, Ser. No. 763,986
Claims priority, application Sweden, Feb. 5, 1976, 7601236
Int. Cl.[2] F16B *35/00*
U.S. Cl. 85—1 T **5 Claims**



1. A hydraulic tensioning means for fastening a first element to a second element with uniform pressure comprising, a single hydraulic nipple inlet disposed on said first element, a plurality of passageways eminating from said nipple within said first element serially connecting a plurality of bolt assemblies, said bolt assemblies including a bolt fastened to said second element extending through and out of said first element having a threaded portion disposed outwardly of said first element, an inner nut having inner and outer threads thereon fastened to said threaded portion of said bolt, an outer nut threaded on the outer threads of said inner nut, a cylinder underlying said outer nut and substantially adjacent to said first element and a piston disposed within said cylinder which underlies said inner nut and surrounds said bolt, said piston having a portion thereon which communicates with said passageways whereby hydraulic pressure within said passageways causes said piston to tension by stretching said bolt through each of said inner nuts, and said pressure simultaneously causes said outer nuts to raise therewith and the tension can therefore be adjusted by tightening said outer nut on said cylinder, releasing said pressure and turning down said inner nut.

4,085,650

HINGE SECURITY STUD

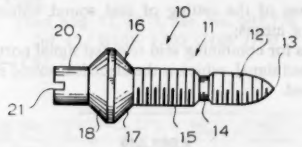
Jean Louis Flynn, P.O. Box 1868, Deland, Fla. 32720

Filed Feb. 28, 1977, Ser. No. 772,725
Int. Cl.[2] F16B *25/00*
U.S. Cl. 85—41 **4 Claims**

1. A hinge security stud comprising:

an elongated screw having an elongated threaded portion, a head portion and a stud portion, said head portion having a pair of oppositely disposed back-to-back of said bevelled portions tapering of annular bevelled portions, one inwardly in the direction of said threaded portion and the second of said bevelled portions tapering inwardly in said stud direction, and said stud portion being an elongated generally cylindrical member intersecting said second annular, bevelled portion, and having a screwdriver tip engaging means formed therein, and said threaded portion

of said security stud being divided into two portions, one having self-threading wood type threads located on the point of said threaded portion of said screw and the second portion having machine type screw threads located between the head portion of said screw and said self-threading wood type threads.

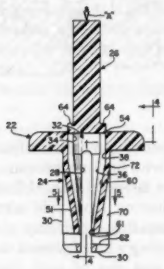


4,085,651

PLASTIC FASTENER

Richard A. Koscik, Richton Park, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 14, 1977, Ser. No. 768,673
Int. Cl.² F16B *13/08*
U.S. Cl. 85—72 **8 Claims**



1. A plastic fastener having a head and an integral bifurcated shank forming at least two shank portions, an axial bore traversing said head and extending throughout said shank, said bore being substantially cylindrical adjacent said head and adapted to accept a complimentary axially moveable drive pin having a predetermined diameter, said bore being tapered and defined within said shank by tapered facing surfaces on said shank portions and said tapered bore having its major diameter terminating at said cylindrical bore adjacent said head, said tapered bore having a substantially uniform radius of curvature of varying depth relative to the axis of said fastener with said radius of curvature being substantially complementary to said pin, each shank portion including an axially disposed radial relief means that extends throughout substantially all of the axial extent of each of said shank portions, said relief means on each shank portion including an axially disposed slot means which is substantially perpendicular to and opens into said bifurcation while extending radially outwardly from said bifurcation at tapering depths for a substantial portion of the axial extent of each shank portion and a second slot means extending radially inwardly from the circumferential outer surface of each shank portion to form between the two tapered slots a thin walled buckle section joining two substantially equal sections of each shank portion, said drive pin which includes at least one laterally extending lug projecting downwardly therefrom and acceptable from axial movement within one of said shank portion slots communicating with said bore, recess means communicating with said one slot adjacent to but spaced from the free end of said shank, said recess means adapted to accept said at least one lug in positive locking relationship when said pin is driven axially in said bore to expand said shank portions.

4,085,652

SCREW FIXING DEVICE FOR STRUCTURAL UNITS OF AGGLOMERATED MATERIAL

Guy Vanotti, Oyonnax, France, assignor to Etablissements Vape, Oyonnax, France

Filed Jun. 24, 1976, Ser. No. 699,480
Claims priority, application France, Jun. 25, 1975, 75 19908
Int. Cl.² F16B *37/04*
U.S. Cl. 85—83 **2 Claims**

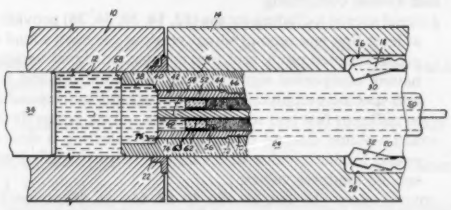
1. A screw-fixing device intended to be integrated in a structural member of agglomerated material, such as plaster or concrete, at the moment of manufacturing of said agglomerated material, comprising a screw and an anchoring sheath adapted to be integrated in said structural member, said anchoring sheath being made of two parts of plastic material, the first part comprising an inner part moulded onto the screw, the second part comprising an outer part surrounding said inner part, said inner and outer parts being shaped so as to be restrained from moving axially with respect to each other, and having a free space between said two parts for accommodating expansion of said sheath material, an outer surface of the inner part and an inner surface of the outer part being provided with helical interlocking structure, said restraint from axial movement being provided by said helical interlocking structure of said inner and outer parts, permitting contingently to unscrew and replace the screw with said inner part of the sheath moulded thereto.

4,085,653

IGNITION DEVICE

Douglas Pray Tassie, St. George, Vt., and Robert A. Pustell, Andover, Mass., assignors to General Electric Company, Burlington, Vt.

Filed Sep. 15, 1976, Ser. No. 723,367
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **10 Claims**



1. A gun comprising:

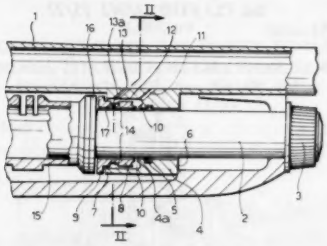
a gun barrel having a projectile receiving cavity, and
an igniter including
an outer tubular element having a conductive inner surface;
an inner element substantially coextensive longitudinally with said outer element and having a conductive outer surface;
a volume, free of internal voids, of closely packed particles of dielectric material, disposed between and interlocked with said inner and outer elements, the peripheral particles of said volume being partially imbedded into said conductive surfaces of said inner and outer elements;
said volume extending less than the full length of said inner element to provide a void at a first end of said igniter, said void being defined by an exposed portion of said conductive surface of said inner element mutually confronting an exposed portion of said conductive surface of said outer element, and the end face of said volume;
sealing means including a solid annulus of dielectric material disposed within said void, in abutment with said end face of said volume and said conductive surfaces of said inner and outer elements, said annulus, said exposed portion of said conductive surface of said inner element and said exposed portion of said conductive surface of said outer element defining a spark chamber which is in fluid flow communication with said projectile receiving cavity.

4,085,654

GAS-OPERATED DEVICE FOR ACTIVATING THE RELOADING MECHANISM OF A GAS-OPERATED AUTOMATIC RIFLE

Giannantonio Panigoni, Brescia, Italy, assignor to Luigi Franchi S.p.A., Brescia, Italy

Filed Aug. 18, 1976, Ser. No. 715,580
Claims priority, application Italy, Sep. 29, 1975, 27752/75
Int. Cl.[2] F41D *5/04*
U.S. Cl. 89—191 A **4 Claims**



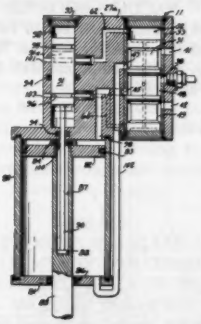
1. In an automatic rifle, a gas-operated device for activating the reloading mechanism of the rifle, comprising:
a cylinder fixed to the rifle barrel, said cylinder having an open end and a closed end;
a piston slidable in said cylinder;
a chamber formed within said cylinder between said piston and said closed end;
means defining a first gas duct communicating with said chamber, and means defining a first opening of said first gas duct into said rifle barrel;
wherein the improvement comprises:
(a) said cylinder and said piston define between them an interstice, coaxial with said cylinder and said piston and communicating with said chamber;
(b) means defining at least one second gas duct communicating with said interstice;
(c) means defining at least one second opening of said at least one second gas duct into said rifle barrel, said at least one second opening being at a position closer to the breech end of said rifle barrel than said first opening of said first gas duct; and
(d) means defining an annular groove in the surface of said piston and means defining at least one vent of said at least one second gas duct into said interstice, said annular groove being opposite said at least one vent in the fully inserted position of said piston in said cylinder.

4,085,655

CONTROL FOR RECIPROCATING PUMPS OR THE LIKE

Lawrence P. Olson, 18006 Pine Ave., Fontana, Calif. 92335

Filed Mar. 29, 1976, Ser. No. 671,121
Int. Cl.[2] F01L *25/06*
U.S. Cl. 91—307 **1 Claim**



1. A control valve for alternately applying fluid pressure to a first and second work chamber to cause a reciprocating stroke of a work device, comprising:
a valve housing having a cylinder therein closed at opposite ends,
an inlet in said housing for admitting pressurized fluid into said cylinder,
means forming a first delivery passage communicating said cylinder with said first chamber,
means forming a second delivery passage communicating said cylinder with said second chamber,
means forming first and second outlet passage in said housing and opening into said cylinder,
a piston slidable in said cylinder between first and second positions,
said piston having annular recesses therein effective when said piston is in said first position to communicate said inlet with said first delivery passage and to communicate the second outlet passage with said second delivery passage,
said recesses being effective when said piston is in said second position to communicate said inlet with said second delivery passage and to communicate the first outlet passage with said first delivery passage,
an additional passage extending through said piston between opposite ends thereof,
said piston having cavities at said opposite ends and said additional passage opening into said cavities,
means for admitting pressurized fluid into said additional passage,
first vent means controlled by said work device when at one end of said stroke to vent one end of said cylinder whereby to enable pressurized fluid at the opposite end of said cylinder to move said piston to said one end of said cylinder, and
second vent means controlled by said work device when at the opposite end of said stroke to vent the opposite end of said cylinder whereby to enable pressurized fluid at said

one end of said cylinder to move said piston to said opposite end of said cylinder,

said piston having a large diameter portion intermediate certain of said recesses therein, which large diameter portion is in sliding engagement with said cylinder and is undercut toward the root of an adjacent one of said recesses, and

said large diameter portion having a circumferential groove therein,

the root of said groove extending adjacent the root of said undercut portion whereby to form a ring section having a flexible root section,

said ring section flexing about said root section upon application of fluid pressure in said adjacent recess.

4,085,656

VACUUM BOOSTER

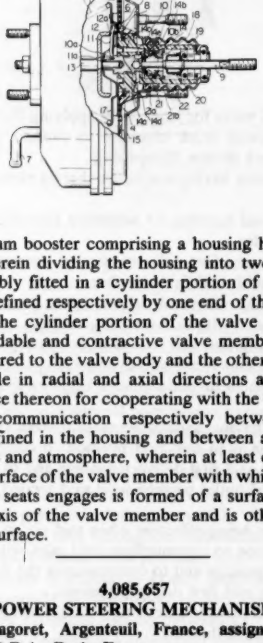
Hiromi Ando, Tokyo, Japan, assignor to Tokico Ltd., Japan

Filed Jul. 12, 1976, Ser. No. 704,621

Claims priority, application Japan, Jul. 19, 1975, 50-88486; Jul. 19, 1975, 50-100333[U]

Int. Cl.[2] F15B *9/10*

U.S. Cl. 91—376 R **11 Claims**



1. A vacuum booster comprising a housing having a movable wall therein dividing the housing into two chambers, a plunger slidably fitted in a cylinder portion of a valve body, valve seats defined respectively by one end of the plunger and one end of the cylinder portion of the valve body, and an axially extendable and contractive valve member one end of which is secured to the valve body and the other end of which is displaceable in radial and axial directions and defining a seating surface thereon for cooperating with the valve seats for controlling communication respectively between said two chambers defined in the housing and between at least one of the chambers and atmosphere, wherein at least one portion of the seating surface of the valve member with which at least one of said valve seats engages is formed of a surface of rotation around the axis of the valve member and is other than a flat plate radial surface.

4,085,657

POWER STEERING MECHANISM

Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

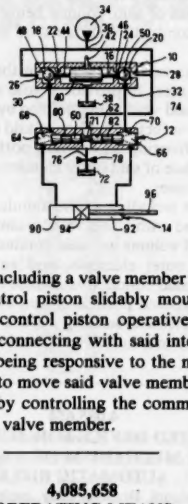
Filed Aug. 11, 1976, Ser. No. 713,326

Claims priority, application France, Aug. 21, 1975, 75 25863

Int. Cl.[2] F15B *9/10*

U.S. Cl. 91—380 **9 Claims**

1. Power steering mechanism comprising a housing defining a cavity and a bore, an input member extending into said cavity and adapted for rotation by an operator, an output member also extending into said cavity and disposed coaxial with the input member, said output member being provided for transmitting rotation which is applied to said input member, said input and output members being resiliently connected, a fluid motor cooperating with the output member for assisting the rotation of the output member in response to rotary motion of the input member, an intermediate sleeve disposed within the cavity and coaxial with the input and output members, said intermediate sleeve being movable relative to the input and output members along their axes of rotation in response to a rotation of the input member, distributing means carried in said housing bore and communicating with said fluid motor, said



distributing means including a valve member within said housing bore and a control piston slidably mounted within said housing bore, said control piston operatively engaging said valve member and connecting with said intermediate sleeve, said control piston being responsive to the movement of said intermediate sleeve to move said valve member relative to the housing bore, thereby controlling the communication to said fluid motor via said valve member.

4,085,658

OPERATING MEANS

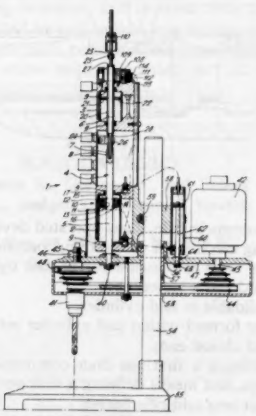
Keld Torben Schneider Sorensen, Auckland, New Zealand, assignor to K. & V. Sorensen Engineering Limited, Auckland, New Zealand

Filed Feb. 27, 1976, Ser. No. 661,928

Claims priority, application New Zealand, Mar. 5, 1975, 176840

Int. Cl.[2] F15B *13/042, 15/22*

U.S. Cl. 91—461 **9 Claims**



1. Operating means comprising an air cylinder and a hydraulic cylinder, said air cylinder and hydraulic cylinder being mounted such that the longitudinal axes thereof lie on substantially the same line, a rod-like member passing through both cylinders, a piston in said air cylinder mounted on said rod-like member, a hollow member passing through said hydraulic cylinder and extending from the ends thereof, said hollow

member being positioned about said rod-like member, a piston in said hydraulic cylinder mounted on said hollow member and dividing the interior of said hydraulic cylinder into first and second chambers, axially adjustable first engagement means between said rod-like member and said hollow member such that movement of the piston in said air cylinder in the direction away from said hydraulic cylinder causes said rod-like member to move a distance predetermined by the position of said first engagement means on said rod-like member before said engagement means engages the end of said hollow member that is further from said air cylinder to thereby cause said hollow member to move said piston in said hydraulic cylinder, second axially adjustable engagement means positioned on said rod-like member between said hollow member and said air cylinder such that movement of the piston in said air cylinder in the direction toward said hydraulic cylinder causes said rod-like member to move through a distance predetermined by the position of said second engagement means on said rod-like member before said second engagement means engages the end of said hollow member that is nearer said air cylinder to thereby cause said hollow member to move said piston in said hydraulic cylinder, means defining a first passageway extending externally of said hydraulic cylinder and connecting the first and second chambers of said hydraulic cylinder and having therein a non-return valve to prevent flow from the second chamber to the first chamber and a flow rate controlling valve such that the flow rate of hydraulic fluid through said first passageway may be varied, means defining a second passageway extending externally of said hydraulic cylinder and connecting the second and first chambers of said hydraulic cylinder and having a non-return valve therein to substantially prevent fluid flow from the first chamber to the second chamber and a flow rate controlling valve therein whereby the flow rate through said second passageway may be controlled, and a stop for limiting the extent to which movement of said rod-like member in the direction from the hydraulic cylinder towards the air cylinder may occur, said stop comprising a substantially cup-shaped threaded nut engageable onto threads on said rod-like member, the diameter of the cup being of a size so that the rim of said cup may engage on parts of said operating means adjacent said hydraulic cylinder, encompassing if necessary said first engagement means.

4,085,659

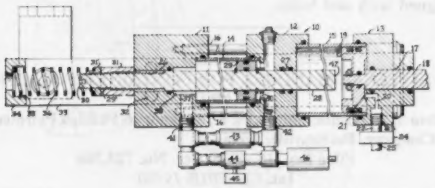
CONTROL DEVICE FOR POWER TOOLS

Barry A. Stunkel, 1170 West Fork, Lake Forest, Ill. 60045

Filed May 28, 1976, Ser. No. 691,005

Int. Cl.² F15B *15/22*

U.S. Cl. 92—8 **2 Claims**



1. A movement control device for power tools comprising

(a) a housing providing a pair of axially aligned independent cylinders,

(b) a first piston in one cylinder and having an elongated piston rod extending from one side thereof and out of one end of said housing,

(c) a second piston in the second cylinder mounted upon an elongated piston rod intermediate its ends, with said rod disposed in both cylinders and having one end extending out of the other end of said housing,

(d) a source of driving medium having communication with said one cylinder for moving said first piston in the direction of said second piston and into contact therewith for correspondingly moving said second piston in one direction in said second cylinder,

(e) resilient means exteriorly of said housing and connected to said one end of said second piston rod for moving the same in an opposite direction through said second cylinder,

(f) a hydraulic system in connection with said second cylinder and having open communication to both sides of said second piston therein,

(g) valve means in said hydraulic system restrictively regulating the flow of fluid from said second cylinder through said hydraulic system so as to regulate the speed of movement of said second piston in one direction by corresponding movement of said first piston through said first cylinder, and

(h) an electrically controlled flow valve connected in parallel to said valve means in said hydraulic system and having an open and a closed position and adapted to permit, in its open position, free flow of hydraulic fluid therethrough in either direction by movement of said second piston as said said second piston is moved by said first piston and said resilient means, said resilient means comprising a coil spring engaging a spring retainer at one end of said second piston rod exteriorly of said housing so as to move the same in one direction through said second cylinder.

4,085,660

PIVOTAL SUPPORT FOR A FLUID ACTUATED CYLINDER WITH MEANS FOR COMMUNICATING PRESSURIZED FLUID THERETO

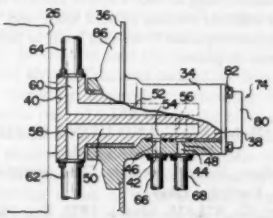
Sumio Yoshinouchi, and Hiroki Tanaka, both of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Nov. 24, 1976, Ser. No. 744,927

Claims priority, application Japan, Dec. 25, 1975, 50-174379[U]

Int. Cl.² F01B *15/04, 29/00*

U.S. Cl. 92—119 **6 Claims**



1. A pivotal support mechanism for a fluid actuated cylinder, said fluid actuated cylinder having piston means forming a pair of opposed fluid chambers, comprising in combination:

a stationary sleeve;

a first pair of fluid passages formed in said stationary sleeve;

a trunnion rotatably received in said stationary sleeve;

a second pair of fluid passages formed in said trunnion;

a pair of annular grooves formed in an inner peripheral surface of said stationary sleeve, wherein each of said second pair of fluid passages is in respective constant fluid communication with a respective one of said first pair of fluid passages through a respective one of said pair of annular grooves and is further in constant fluid communication with a respective one of said pair of opposed fluid chambers in said fluid actuated cylinder;

means formed at one end of said trunnion for securely holding said fluid actuated cylinder; and

thrust bearing means at the other end of said trunnion for holding said trunnion in position in said stationary sleeve

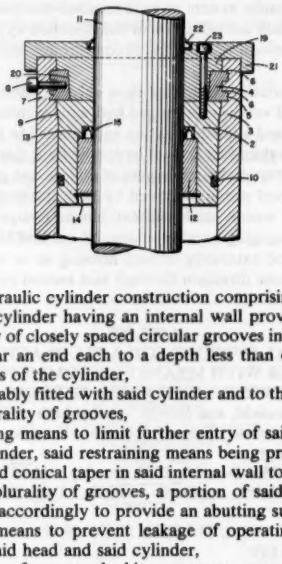
against axial thrust which may be applied to said trunnion in either axial direction.

4,085,661

DOUBLE WEDGE-LOCK CYLINDER HEAD

William W. Schriever, Orient, N.Y., assignor to Edward D. Meyer, Cutchoque, N.Y.

Filed Jul. 16, 1976, Ser. No. 705,889
Int. Cl.[2] F16J *15/18, 11/02*
U.S. Cl. 92—170 26 Claims



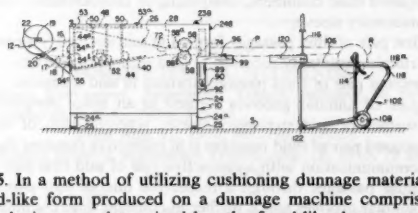
1. An hydraulic cylinder construction comprising
a hollow cylinder having an internal wall provided with a plurality of closely spaced circular grooves in the internal wall near an end each to a depth less than one-half the thickness of the cylinder,
a head slidably fitted with said cylinder and to the interior of said plurality of grooves,
a restraining means to limit further entry of said head into said cylinder, said restraining means being provided by a truncated conical taper in said internal wall to the interior of said plurality of grooves, a portion of said head being tapered accordingly to provide an abutting surface,
a sealing means to prevent leakage of operating fluid between said head and said cylinder,
a plurality of arcuate locking segments engaged in said grooves and abutting at least a major portion of the perimeter of the exterior surface of said head, and
a retaining means separate from said head to hold said locking segments in place.

4,085,662

METHOD OF MAKING AND USING CUSHIONING DUNNAGE MATERIAL

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corporation, Eastlake, Ohio

Division of Ser. No. 573,615, May 1, 1975, Pat. No. 4,026,198.
This application Nov. 22, 1976, Ser. No. 744,153
Int. Cl.[2] B31F *1/00*
U.S. Cl. 93—1 WZ 10 Claims



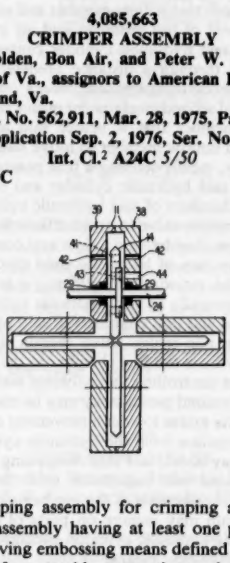
5. In a method of utilizing cushioning dunnage material in pad-like form produced on a dunnage machine comprising, producing a predetermined length of pad-like dunnage material on a dunnage producing machine, and emitting it from the latter through an exit opening in the machine, storing it as it is being emitted by said dunnage producing machine directly onto a mobile transfer cart, separable from the dunnage machine, moving the transfer cart to a location remote from the dunnage producing machine for use of the dunnage material at such remote location, and wherein the transfer cart includes a rotatable spindle mounted generally horizontally thereon, said spindle including a U-shaped bracket attached thereto and projecting laterally therefrom, and including the step of inserting the leading end of the dunnage produced on the dunnage producing machine into the U-shaped bracket to secure said leading end to the spindle and rotating said spindle on the cart so as to roll-up a predetermined amount of the dunnage material being emitted from the dunnage producing machine, onto the transfer cart simultaneous with the production of said dunnage material by said dunnage producing machine.

4,085,663

CRIMPER ASSEMBLY

Herbert K. Holden, Bon Air, and Peter W. Mansfield, Richmond, both of Va., assignors to American Filtrona Corporation, Richmond, Va.

Division of Ser. No. 562,911, Mar. 28, 1975, Pat. No. 4,007,668.
This application Sep. 2, 1976, Ser. No. 719,690
Int. Cl.[2] A24C *5/50*
U.S. Cl. 93—1 C 1 Claim



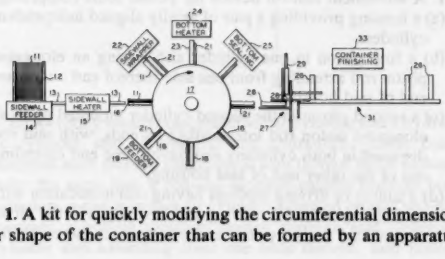
1. In a crimping assembly for crimping a rod of fibrous material, said assembly having at least one pair of crimping wheels each having embossing means defined on its peripheral surface, means for rotatably supporting each pair of crimping wheels so as to juxtapose their respective embossing means and means for rotating each crimping wheel, the improvement comprising at least one radial alignment slot located in each of said crimping wheels for aligning said wheels within the assembly, said radial slot being alignable with holes in side plate bearing blocks mounted on each side of said crimping wheels, and including means for securing each of said crimping wheels on the wheel rotating means while said radial alignment slot is aligned with said holes.

4,085,664

UNIVERSAL MANDREL FOR CONTAINER FORMING APPARATUS

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 15, 1976, Ser. No. 723,396
Int. Cl.[2] F01B *19/00*
U.S. Cl. 93—44.1 R 11 Claims



1. A kit for quickly modifying the circumferential dimension or shape of the container that can be formed by an apparatus

which forms a tubular container by first clamping a flat blank of sheet material against a basic mandrel with a clamping means comprising a basic clamping shoe and a clamping arm capable of moving the basic clamping shoe from a position which allows a blank to be placed between the basic clamping shoe and the basic mandrel to a position which holds a portion of the blank so positioned against the basic mandrel and then folding the thus clamped blank around said basic mandrel with a folding means,

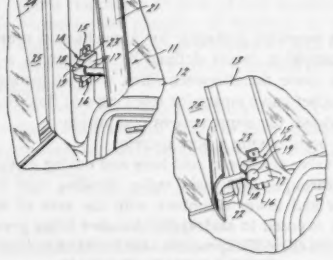
said kit comprising (1) at least one tubular mandrel sleeve being designed so that if a tubular container were formed by folding an appropriately sized blank around said mandrel sleeve the thus formed tubular container could be slid off the mandrel sleeve and so that the mandrel sleeve is capable of being removably secured around said basic mandrel in coaxial alignment therewith, wherein the internal diameter of the tubular mandrel sleeve is larger than that necessary to allow the mandrel sleeve to be removably secured around the basic mandrel and the mandrel sleeve contains in one end thereof indentation means corresponding to a projection portion of a flange to which the basic mandrel is mounted so that when said mandrel sleeve is placed over said basic mandrel said indentation means can mate with said portion of said flange to insure that the mandrel sleeve is in coaxial alignment with said basic mandrel, and (2) a corresponding replacement clamping shoe for the respective mandrel sleeve, each replacement shoe being of such size that when the corresponding mandrel sleeve is secured around said basic mandrel and the respective replacement clamping shoe is substituted for said basic clamping shoe the thus altered clamping means without further substantial adjustment or modification will be able to function to move said replacement clamping shoe from a position which allows a blank to be placed between said replacement shoe and said mandrel sleeve to a position in which the replacement clamping shoe will hold a blank against the corresponding mandrel sleeve.

4,085,665

ADJUSTABLE AUTOMOBILE VENT

Stephen J. Paxton, Troy, Mich., assignor to Stephen J. Paxton, Trust, Troy, Mich.

Filed Oct. 22, 1976, Ser. No. 734,720
Int. Cl.[2] B60J *1/20*
U.S. Cl. 98—2.12 **2 Claims**



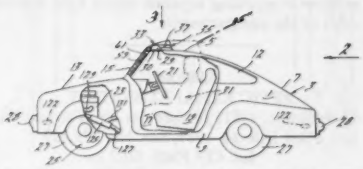
1. An adjustable automobile vent comprising a single base, means securing said base to the inside of a stationary pillar of an automotive vehicle, an elongated deflector having an arcuate cross section creating a recessed surface on one side thereof, and means movably mounting said deflector on said base in a manner permitting the deflector to be moved between a first position inside the vehicle with the axis of said arcuate cross section closely parallel to and adjacent said pillar and a second operating position extending partially out of and partially into the car interior through an opening created by partial retraction of the adjacent vehicle window, said mounting means comprising a stem extending from the concave surface of said deflector adjacent one end thereof and carrying a ball, said base having a socket receiving said ball, said socket being open in a rearward direction whereby said deflector may be swung rearwardly from its stored position and then swung outwardly through a window opening to a position wherein the axis of said arcuate cross section is transverse to said pillar.

4,085,666

ROOF-TOP OBSERVATION CENTER FOR AUTOMOBILES

William A. Ternes, 1122 Three Mile Dr., Grosse Pointe Park, Mich. 48230

Filed Dec. 15, 1975, Ser. No. 641,114
Int. Cl.[2] B60H *1/26*
U.S. Cl. 98—2.14 **16 Claims**



1. An observation center for an automobile, said automobile including a body with a front windshield and side sections having windows therein and a roof and back section and defining an interior passenger compartment including a driver's seat, said observation center comprising means forming an upper compartment as a part of said body and located above the level of said roof, said upper compartment extending transversely across a substantial part of the width of the body and opening on its bottom side into said passenger compartment approximately vertically above the driver's seat, said means including a first section forming the top and front of said compartment, said means including a pair of second sections forming respectively the opposite sides of the compartment, said second sections including transparent wall portions facing to at least the side and rear of the body, said means including a third section forming the back of said compartment, said third section being located ahead of the rear ends of the windows in said sidewalls and including a window extending transversely across a substantial part of the width of the body and located vertically above said roof to provide an unobstructed line of sight from said window to and beyond the rearmost portion of the body, rear image viewing optical means in said upper compartment having a line of sight extending through said compartment window and providing a rear image visible to a driver seated in said driver's seat whereby said compartment provides means for the driver to observe the scene at the rear of the body, each of said second sections including signals light means adjacent said transparent wall portions for signalling at least stops and turns whereby said compartment provides means for others to observe from at least the side and rear signals of deceleration and turning of the automobile, said second sections also including signal light means providing parking, running, and emergency lights.

12. An observation center for an automobile, said automobile including a body with a front windshield and side sections having windows therein and a roof and back section and defining an interior passenger compartment including a driver's seat, said observation center comprising means forming an upper compartment as a part of said body and located above the level of said roof, said upper compartment extending transversely across a substantial part of the width of the body and opening on its bottom side into said passenger compartment approximately vertically above the driver's seat, said means including a first section forming the top and front of said compartment, said means including a pair of second sections forming respectively the opposite sides of the compartment, said

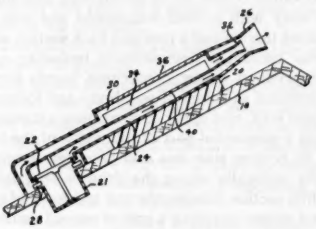
second sections including transparent wall portions facing to at least the side and rear of the body, said means including a third section forming the back of said compartment, said third section being located ahead of the rear ends of the windows in said sidewalls and including a window extending transversely across a substantial part of the width of the body and located vertically above said roof to provide an unobstructed line of sight from said window to and beyond the rearmost portion of the body, rear image viewing optical means in said upper compartment having a line of sight extending through said compartment window and providing a rear image visible to a driver seated in said driver's seat whereby said compartment provides means for the driver to observe the scene at the rear of the body, each of said second sections including signal light means adjacent said transparent wall portions for signalling at least stops and turns whereby said compartment provides means for others to observe from at least the side and rear signals of deceleration and turning of the automobile, said second sections comprising separate signal light fixtures closing the sides of the compartment.

4,085,667

ATTIC EXHAUST SYSTEM

Neil B. Christianson, 10813 Broadwater Dr., Fairfax, Va. 22030

Filed Feb. 24, 1977, Ser. No. 771,497
Int. Cl.[2] F24F 7/02
U.S. Cl. 98—43 R **4 Claims**



1. An attic exhaust system adapted to be supported on the roof of a building having an attic, comprising: a diffuser nozzle; an ejector nozzle positioned within the diffuser nozzle and having its nozzle adjacent the throat of the diffuser nozzle; an attic vent; means, connected between said attic vent and said diffuser nozzle, for providing a first air flow channel between the attic vent and the diffuser nozzle; means, connected between said attic vent and said ejector nozzle, for providing a second air flow channel between the attic vent and the ejector nozzle; a turbine rotor within said first flow channel; means, connected to turbine rotor, for supplying compressed air to said second flow channel; means for admitting solar radiation energy to said second flow channel; means, within said second flow channel, for absorbing solar energy radiation, whereby the air in said second flow channel is heated by radiant energy absorbed by the solar energy radiation absorbing means.

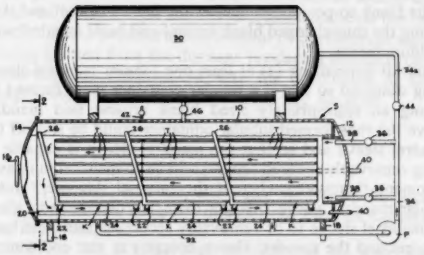
4,085,668

HEAT EXCHANGE APPARATUS FOR PRODUCTS IN CONTAINERS

Adil A. Mughannam, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 26, 1977, Ser. No. 762,537
Int. Cl.[2] A23C 3/02
U.S. Cl. 99—483 **18 Claims**

1. In a fluid treatment apparatus for food products or the like in containers, said apparatus being of the type comprising a processing chamber, means for mounting open ended channel-like container supporting trays having a bottom wall and side walls in said chamber, the side walls of a lower tray supporting a tray above it and means for circulating hot water along said trays for heat exchange with the products; the improvement wherein the upper sides of the bottom walls of said trays are provided with laterally spaced, longitudinally disposed upwardly projecting members for supporting the bottoms of containers above the bottom wall of their trays and the under



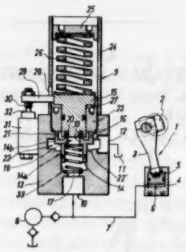
sides of the bottom walls of the trays are provided with laterally spaced, longitudinally disposed, downwardly projecting members for confining the tops of containers in the trays below, during treatment.

4,085,669

OVERLOAD PROTECTOR FOR MECHANICAL PRESS

Keitaro Yonezawa, Kobe, Japan, assignor to Aioi Seiki Kabushiki Kaisha

Filed Apr. 27, 1976, Ser. No. 680,731
Claims priority, application Japan, May 15, 1975, 50-58055; Dec. 12, 1975, 50-152099
Int. Cl.[2] B30B 15/28
U.S. Cl. 100—53 **4 Claims**



1. In an overload protector for a mechanical press having force transmitting means defined by a piston in a cylinder defining a space therebetween filled with an incompressible fluid and relief valve means for relieving said fluid in response to an overload, the improvement comprising:

a valve body having a bore therein;

a main valve slidable in said bore and having a passageway therethrough; said main valve dividing said bore into upper and lower chambers with the area of said main valve exposed to said upper chamber being greater than the area thereof exposed to said lower chamber;

a fluid connection from said lower chamber to said space and a venting outlet from said upper chamber, said outlet being closed by said main valve when in an upper position and open to said upper chamber where said main valve moves downwardly;

a pilot valve seat around the upper end of said passageway;

a pilot valve moveable downwardly into said upper chamber to engage said seat and close said passageway when said main valve is in said upper position;

yieldable means urging said main valve upwardly; and

adjustable yieldable means urging said pilot valve downwardly.

4,085,670

CHECK DIGIT NUMBERING MECHANISMS

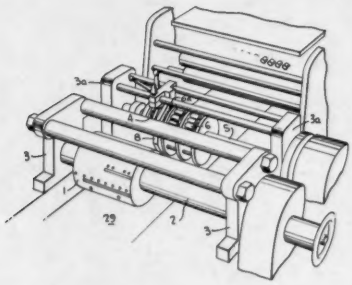
William Poole, Paragon Works, Canning Town, London E. 16, England

Filed Jul. 1, 1976, Ser. No. 701,804

Claims priority, application United Kingdom, Jul. 4, 1975, 28198/75

Int. Cl.[2] B41U *3/42*

U.S. Cl. 101—76 10 Claims



1. Check digit numbering mechanism for generating check digits in accordance with a check digit load setting, comprising:

printing means for seriatim printing of reference numbers on a printing medium;

check digit printing means for printing a check digit on said printing medium for at least some of said reference numbers;

means for generating a signal each time a reference number is printed;

check digit numerator means for indexing said means for printing a check digit;

a plurality of solenoids and a corresponding plurality of armatures each associated with a particular one of said solenoids, said solenoids and said check digit numerator means being movable with respect to one another, at least one of said armatures being movable to engage said check digit numerator means for the actuation thereof with the relative motion of said check digit numerator means and said solenoids;

control means responsive to each of said signals for selectively actuating said plurality of solenoids to index said check digit numerator means whereby a check digit associated with said reference number is printed on said printing medium; and

said control means including switching means for changing the setting of said control means to select those solenoids to receive said signals in accordance with said check digit loading setting.

4,085,671

TORQUE LIMITING USED SCREEN TAKE-UP ASSEMBLY AND DRIVE

Albert George Ronald Gates, and Michael Maynard, both of London, England, assignors to Gestetner Limited, London, England

Filed Oct. 26, 1976, Ser. No. 735,776

Claims priority, application United Kingdom, Oct. 27, 1975, 44139/75

Int. Cl.[2] B41F *15/12, 15/38*

U.S. Cl. 101—128.1 11 Claims

1. A duplicator comprising:

(a) rotatable duplicator cylinder means;

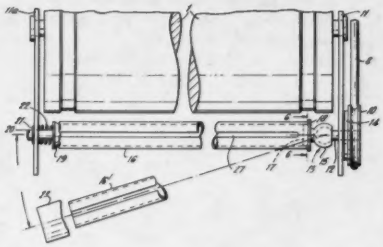
(b) a stencil-supporting ink screen mounted on said duplicator cylinder means to circulate about said duplicator cylinder means during rotation of said cylinder means in use of the duplicator and adapted to carry a stencil;

(c) core means for receiving said stencil or ink screen;

(d) means for mounting said core means alongside said duplicator cylinder means;

(e) first drive transmission means driveably connected to said duplicator cylinder means normally driving said duplicator cylinder means in a first direction of rotation;

(f) second drive transmission means driveably connected between said first drive transmission means and said means for mounting said core means alongside said duplicator cylinder means, for driving said core means in rotation, said second drive transmission means and said core means being dimensioned to ensure that the peripheral speed of



said core means when driven by said second drive transmission means is higher than the peripheral speed of said duplicator cylinder means;

(g) torque-limiting frictional engagement means in said second drive transmission means to limit the driving torque to said core mounting means to a value lower than that required to rupture said stencil or ink screen during rotation of said duplicator cylinder means in a direction opposite to said first direction during transfer to said core means; and

(h) a one-way clutch in said second drive transmission means and arranged to transmit drive to the core means during rotation of said duplicator cylinder means in said opposite direction of rotation and to freewheel during rotation of said duplicator cylinder means in said first direction.

4,085,672

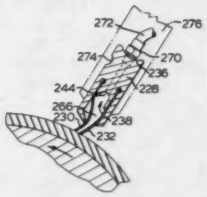
INKING DEVICE

John Grosart, 14 Benedict Rd., Islington, Ontario, (M9A 1X2) Canada

Continuation-in-part of Ser. No. 612,505, Sep. 11, 1975, abandoned. This application Dec. 21, 1976, Ser. No. 753,071

Int. Cl.[2] B41F *9/10*

U.S. Cl. 101—169 6 Claims



1. An device for applying ink to a printing surface, the device comprising:

a body in the form of an elongate one-piece extrusion defining two spaced limbs extending longitudinally of the extrusion, and a central formation intermediate said limbs and defining with said limbs two longitudinally extending slots;

two ink flow control blades having respective inner portions received in said slots in the body, said limbs of the body clamping the blades against said central portion, and the blades projecting from the body to define an ink chamber with the body and parallel outer edges for contact with a printing surface in use;

sealing means located at respectively opposite ends of the blades to define ends of said ink chamber; and,

inlet means in the body for delivery of ink to said chamber;

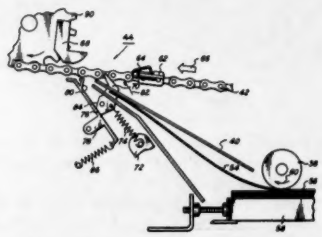
whereby, in use, when the device is arranged with the blades in contact with a printing surface and spaced from one another, ink flows from the ink chamber between the blades and onto the printing surface.

4,085,673

SHEET FEEDING APPARATUS

Ronald R. Wierszewski, Henrietta, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 12, 1974, Ser. No. 496,503
Int. Cl.² B41F *21/04*
U.S. Cl. 101—242 **6 Claims**



1. A sheet feeding apparatus of the type being arranged to separate and advance successive sheets from a stack thereof, wherein the improvement includes;

a normally closed sheet gripping member;

means for advancing said sheet gripping member;

means for aligning successive sheets, said aligning means includes a frame, a registration member having a generally planar surface extending transversely to the path of sheet movement, said registration member being mounted pivotably on said frame, and biasing means, for resiliently urging said registration member to pivot from the inoperative position, wherein the planar surface thereof is spaced from the path of sheet movement, to the operative position, wherein the planar surface thereof extends transversely to the path of sheet movement;

means, responsive to said advancing means moving said sheet gripping member to a first preselected position, for moving said aligning means from an inoperative position spaced from the path of movement of the advancing sheet to an operative position in the path of movement of the advancing sheet so that the leading edge of the sheet engages said aligning means, said moving means includes a first cam member mounted pivotably on said frame member and in engagement with said registration member, said cam member having a profile such that in a first position the planar surface of said registration member is spaced from the path of sheet movement and in the second position the planar surface of said registration member extends transversely to the path of sheet movement, and biasing means resiliently urging said first cam member to pivot from the second position to the first position; and

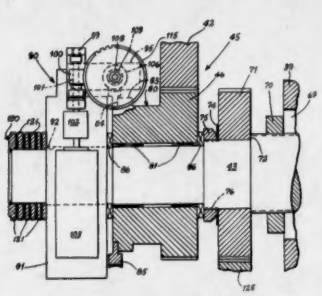
means for opening said sheet gripping member in response to said advancing means moving said sheet gripping member to a second preselected position, said moving means returning said aligning means to the inoperative position in response to said gripping member being at the second preselected position so that the opened sheet gripping member receives the leading edge of the sheet.

4,085,674

REGISTRATION UNIT FOR PRINTING OR COLLATING APPARATUS

Frank M. Biggar, III, Angola, N.Y., assignor to Frank M. Biggar, Jr., Hamburg, N.Y.

Filed Jul. 30, 1976, Ser. No. 710,143
Int. Cl.² B41F *13/14*
U.S. Cl. 101—248 **19 Claims**



1. In an apparatus for performing operations on a continuous paper web, a registration unit for changing the phase of a first shaft relative to a second shaft, said shafts rotatably mounted between parallel frame members, said registration unit comprising a sleeve rotatably mounted about said second shaft and having an output gear mounted thereto and rotatably therewith, said gear being concentric with said second shaft, an output drive gear mounted to said sleeve and concentric with said second shaft for rotation with said sleeve, means responsive to rotation of said output gear for drivingly rotating said first shaft, means rotatably driving said second shaft, and means mounted to said second shaft for rotation therewith outboard of said sleeve and frame members and at the same side of said frame as said sleeve and engaging said output drive gear for selectively rotating said output drive gear relative to said second shaft, said means mounted to said shaft and engaging said output drive gear further comprising a split collar secured to said second shaft for rotation therewith outboard of said sleeve, an electric motor secured to said collar for rotation therewith and said second shaft, slip ring means concentric and rotatable with said second shaft for supplying electrical power to energize said motor, gear drive means for driving said output drive gear relative to said second shaft in response to rotation of said motor shaft, and means for selectively energizing said motor for selective rotational displacement of said output drive gear, sleeve, output gear and first shaft relative to said second shaft.

4,085,675

AUTOMATIC ELECTRICAL CREDIT-CARD IMPRINTER

Naohiro Yoshikawa, Itabashi; Sadaharu Sato, Kodaira; Masanori Matsubara, Futususa, and Masao Hosoda, Higashiyamto, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Nov. 29, 1976, Ser. No. 748,621
Claims priority, application Japan, Dec. 2, 1975, 50-144375
Int. Cl.² A41F *3/04*
U.S. Cl. 101—269 **12 Claims**

1. An apparatus for imprinting indicia from a master on a copy sheet, said apparatus comprising:

a support having a holder for said master;

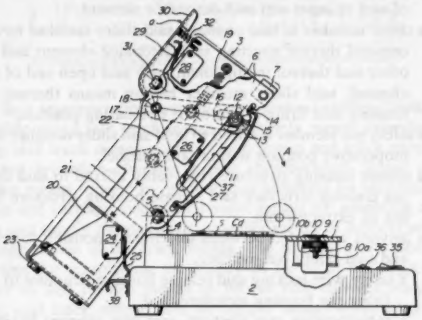
a printing head movable on said support between an inoperative position spaced from said holder and an operative position closely juxtaposed with said holder;

a roller displaceable on said printing head between a pair of roller end positions and engageable in said operative position of said head through a copy sheet lying on a master in said holder with said master;

means including an electromagnetic element and having a

ferromagnetic element for holding said head in said operative position, one of said elements being on said head and the other element being on said support;

means including a switch between said head and said roller, connected in circuit with said electromagnetic element, and displaceable between a closed position corresponding to one end position of said roller for energization of said electromagnetic element and an open position corresponding to the other end position of said roller for deenergization of said electromagnetic element;



means in said head including an electrical actuator electrically energizable to move said roller from said one end position into said other end position;

a spring urging said roller into said one end position;

an operating member on said head; and

a switch connected between said operating member and said head and connected in circuit with said actuator for deenergizing same on actuation of said operating member.

4,085,676

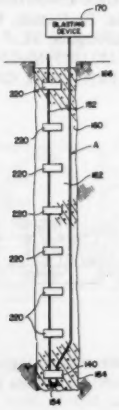
ELONGATED FLEXIBLE DETONATING DEVICE

Brooke J. Calder, Jr., Solon; Robert J. Belock, Wellston, and Roger N. Prescott, Lyndhurst, all of Ohio, assignors to Austin Powder Company, Beachwood, Ohio

Division of Ser. No. 582,993, Jun. 2, 1975, Pat. No. 4,024,817. This application Dec. 2, 1976, Ser. No. 746,825

Int. Cl.[2] F42D *1/04*

U.S. Cl. 102—23 **3 Claims**



1. A method of detonating an explosive in a bore hole having an innermost end and an outermost end, said method comprising the steps of:

a. providing a first detonating cord having two ends and a transversely transmittable energy sufficient to detonate said explosive;

b. providing an elongated detonating device having first and second ends and including an inner second detonating cord and an outer energy absorbing layer which device adjacent said layer has a transversely transmittable energy insufficient to detonate said explosive and said first detonating cord;

c. stripping said outer layer from first end of said elongated device;

d. connecting said first end of said elongated device to one end of said first detonating cord;

e. placing said connected end adjacent said innermost end of said bore hole with said second end of said elongated device extending to a position adjacent said outermost end of said bore hole and said first cord extending from said innermost end toward said outermost end of said bore hole; and,

f. initiating said second end of said element.

4,085,677

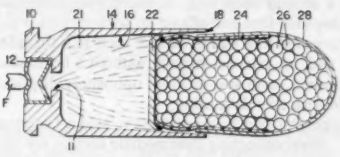
HAND LOADED SHOT SHELL

Michael John Marcinkiewicz, 13 Madison St., Chicopee, Mass. 01020

Filed Oct. 26, 1976, Ser. No. 735,421

Int. Cl.[2] F42B *7/04*

U.S. Cl. 102—42 R **8 Claims**



1. A shotshell comprising: a tubular case having a cylindrical sidewall and a base and a mouth at its opposite ends and with the I.D. of the sidewall increasing progressively from base to mouth,

the base having a primer pocket and a flash-hole leading through the base from the primer pocket,

a primer in the primer pocket,

a powder charge in the case forwardly of the base, means comprising a non-obturating type wad for allowing a gradual progressive release of the gas around the wad periphery and into the progressively increasing annular space between wad periphery and sidewall I.D. and interiorly of the nose cap for achieving nose cap blow off in advance of shot charge propulsion,

said means comprising a non-obturating type wad seated in the case forwardly of the powder charge with a peripheral edge in embracement with the sidewall I.D.,

a shot charge forwardly of the wad, and

a nose cap forwardly of the shot charge and seated within the case mouth.

4,085,678

KINETIC ENERGY, IMPACT-SEPARATED, FOLLOW-THROUGH UNGULA PENETRATOR

William R. Heincker, Eglin AFB, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 25, 1977, Ser. No. 790,647

Int. Cl.[2] F42B *11/14*

U.S. Cl. 102—52 **1 Claim**

1. A munition, adapted for use in penetrating a hard concrete target, comprising:

a. a forward section having a fore end, and a cylinderlike aft end of preselected diameter and in the structural form of

an ungula having a rear surface inclined at a predetermined angle;

b. an aft section comprising:

(1) a threaded, cylinder-like fore end of the same diameter as said aft end of said forward section, and in the structural form of an ungula having a front surface inclined complementary to said inclined rear surface of said aft end of said forward section;

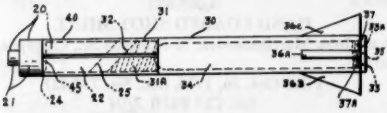
(2) a closed openable aft end that is finned;

(3) a cavity having a mouth, with said mouth located at said closed openable aft end;

(4) and, a plug threadedly connected to said closed openable aft end for selectively closing and opening said aft end;

c. and, a hollow cylinder-like frangible intermediate section interposed between, and releasably interconnecting, said forward section and said aft section, wherein said intermediate section has:

(1) a first open end into which said aft end of said forward section is press fitted;



(2) a second open end, threaded complementary to said threaded fore end of said aft section, into which the said threaded fore end of said aft section is threadedly fitted;

(3) and, an external surface with two horizontal grooves therein, with said grooves oppositely disposed in parallel-spaced relationship;

whereby said forward section, said aft section, and said interconnecting intermediate section are integrated to form a single cylinder-like configurated munition;

and, whereby upon impact of said forward section with said hard concrete target, said intermediate section breaks along said grooves and separates from said forward section and also from said aft section, and said forward section fractures the hard concrete target and makes a penetration therein and therethrough, and thereafter said aft section passes into and through said fractured and penetrated hard concrete target.

4,085,679

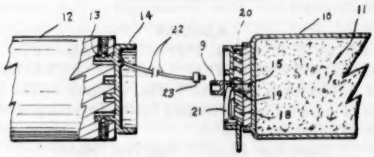
FUZE FOR EXPLOSIVE MAGNETOHYDRODYNAMIC GENERATOR

George Webb, Richmond, and Keith D. Burgess, Rushville, both of Ind., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 23, 1976, Ser. No. 753,960

Int. Cl.[2] F42C *15/34*

U.S. Cl. 102—70 R **2 Claims**



1. Apparatus for detonating an explosive charge at the center of an MHD generator comprising

an explosive charge container,

an explosive charge within said container,

a booster explosive element mounted on said container in detonating communication with said explosive charge,

a firing pin housing structure fixedly attached to said explosive charge container, said firing pin housing structure defining a channel transverse and adjacent to said booster explosive element, said channel having a closed end and an open end,

a lever type firing pin pivotally mounted within said firing pin housing structure,

a detonator element in said channel

a spring in said channel interposed between said closed end of said channel and said detonator element,

a slider member in said channel, said slider member having one end thereof abutting said detonator element and the other end thereof in alignment with said open end of said channel, said slider member having means thereon for rotating said firing pin into the detonating position,

a safety pin member inserted to hold said slider member in an inoperative position within said channel,

a release housing structure removably affixed to said firing pin housing structure said release housing structure having an extractor rim,

a lanyard connected between said release housing structure and said safety pin member,

a safety wire locking said release housing structure to said firing pin housing structure, and

a reciprocating ram element, said ram element having a safety wire severing means and a mechanism for engaging the extractor rim of said release housing structure, said reciprocating ram element being adapted to sever said safety wire and engage and retain said release housing structure, firing pin housing structure and explosive charge container in a retracting action and retain said release housing structure and eject said firing pin housing structure and explosive charge container in a thrusting action whereby full extension of said lanyard removes said safety pin member to enable said spring to bias said detonator element into alignment with said booster explosive element and move said slider member through said open end of said channel into an operative position, said rotating means on said slider member thereby rotating said firing pin causing the subsequent detonation of said explosive charge.

4,085,680

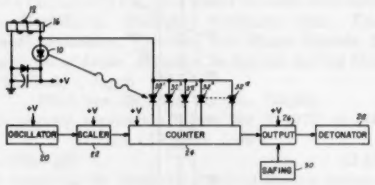
FUZE ENCODER

Richard Thomas Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Feb. 17, 1977, Ser. No. 769,649

Int. Cl.[2] F42C *11/04*; G06K *7/10*

U.S. Cl. 102—70.2 R **8 Claims**



1. A fuze for ordnance comprising:

a power supply including a source of radiation;

counter means;

means for presetting said counter means to a selectively variable count, including

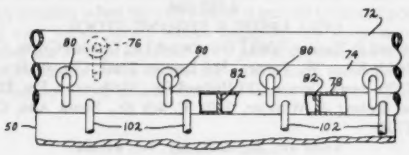
radiation responsive switching means, and

means for selectively passing radiation from said source of radiation to said switching means.

4,085,681
TRANSPORTATION SYSTEM

Gerald L. Barber, 1209 Edwards Rd., Greenville, S.C. 29607

Filed Apr. 29, 1976, Ser. No. 681,417
Int. Cl.[2] B61B *13/08, 13/12*
U.S. Cl. 104—23 FS 19 Claims

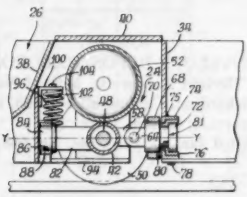


1. In a transportation system; track means, carriage means movable along said track means, air supply means extending along said track means, said carriage means and track means forming levitation chamber means therebetween, linear air turbine means formed by cooperating elements on said track means and carriage means, first valve means for admitting air from said supply means to said chamber means to support said carriage means in the track means, and second valve means operable for controlling the supply of air from said supply means to said turbine means to propel said carriage means along said track means, said air supply means comprising a series of parallel and longitudinally coextensive conduits, compressor means connected to one of the conduits of said series, pressure reducing valve means connecting each conduit with the next adjacent conduit so the pressure reduces in the conduits from said one conduit to the final conduit at the other end of the series of conduits, the final conduit of said series of conduits comprising a plurality of longitudinally spaced unvalved partitions dividing the conduit into axial segments, said second valve means being interposed between said turbine means and respective segments of the last-mentioned said conduit, each said segment of said final conduit supplied with air from the preceding conduit in the series of conduits via a respective one of said pressure reducing valves, and a flow control valve in series with each pressure reducing valve.

4,085,682
VEHICLE SHOCK ABSORBING ARTICULATED JOINTED SUSPENSION

Robert C. Nelson, and David Toney, both of Bluefield, W. Va., assignors to New River Manufacturing Company, Inc., Glen Lyn, Va.

Filed Dec. 8, 1976, Ser. No. 748,639
Int. Cl.[2] B61F *3/00, 5/16, 5/30, 5/50*
U.S. Cl. 105—157 R 5 Claims



1. In a vehicle, a frame, an axle assembly having an axle housing with a wheel supporting axle rotatably journaled therein, wheels at the ends of said axle, connecting means mounted on the frame by trunnion means which provide a pivotal connection about a fixed axis extending generally longitudinally of the direction of movement of the vehicle; improved ride suspension means comprising:

separate means for pivotally securing said connecting means to one side of the axle housing about a horizontal axis intersecting and extending generally transversely of the longitudinal axis,

support means at the other side of said axle housing being tiltable up and down about said transverse pivotal connection, and

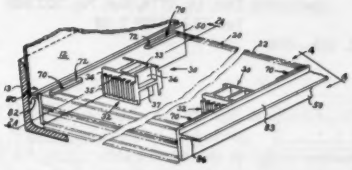
spring means mounted on said support means for supporting said frame for cushioned up and down movement,

whereby shocks applied to the axle housing through the wheels are absorbed by rocking of the axle assembly about said longitudinal axis and by up and down tilting movement of said transverse pivotal connection within a range permitted by said spring means.

4,085,683
PLASTIC CLOSURE FOR NAILABLE STEEL FLOORING PANELS

Gary L. Harting, St. Charles; Robert F. Sutter, St. Louis, and Lowell L. Malo, St. Peters, all of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 562,998, Mar. 27, 1975, abandoned. This application Dec. 9, 1976, Ser. No. 749,141
Int. Cl.[2] B61D *17/10*
U.S. Cl. 105—424 39 Claims

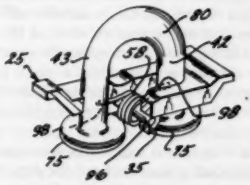


1. A nailable steel flooring insert comprising: a plastic member including a generally vertical end closure closing one of the vertical openings which occurs at opposite ends of nailable steel flooring panels extending in a transportation vehicle to a position adjacent, but laterally spaced from, a generally vertical wall in said vehicle; at least one gap closure flap attached to a first face of said end closure effective to engage the vehicle wall in interference fit and close the gap between said end closure and said vehicle wall; in engaged position said flap being at least partially deformed and thereby urging said insert into engagement with said nailable steel flooring panel and said vehicle wall.

4,085,684
QUICK DISCONNECT TIE-DOWN ANCHOR

Richard Earl McLennan, Rancho Palos Verdes, and Robert Looker, Carpenteria, both of Calif., assignors to Satron, Inc., El Segundo, Calif.

Continuation-in-part of Ser. No. 596,666, Jul. 17, 1975, Pat. No. 4,020,770. This application Jan. 26, 1977, Ser. No. 762,384
Int. Cl.[2] A44B *19/00;* B25B *25/00;* B60P *7/08;* B61D *45/00*
U.S. Cl. 105—482 5 Claims



1. A quick disconnect dual stud-type tie-down anchor for use with a track having a groove and spaced upper flanges, the flanges forming a series of slotted lips, each of predetermined

dimensions, the tie-down anchor being assembled to the track by insertion of the studs thereof through the slots for retention under the flanges and being removed by passage of the studs through the slots, comprising:

retainer means including spaced lifting portions, a single aperture elongated in the direction of the track, and locking means dimensioned to be received through a slot of the track;

insert means positioned in the single aperture, having a generally U-shaped body, and including substantially parallel legs for alignment with the slots of the track and extending through the single aperture;

stud means at the end of each of said legs dimensioned to be received through the slots of the track; and,

biasing means positioned in the single aperture and acting between said insert means and said retainer means to bias said locking means into a slot of the track when said stud means are positioned under the lips of the track.

4,085,685

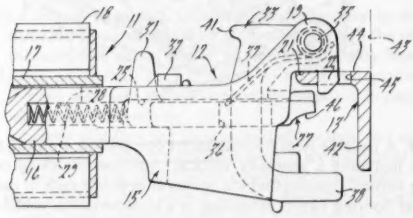
END FITTING

Thomas G. Stone, Farmington, Mich., assignor to Evans Products Company, Portland, Oreg.

Continuation of Ser. No. 328,929, Feb. 2, 1973, abandoned. This application Dec. 16, 1974, Ser. No. 532,908

Int. Cl.[2] B60P 7/08

U.S. Cl. 105—498 **2 Claims**



1. An end fitting for detachably interconnecting a cross bar of the like interchangeably to a plurality of different type belt rails including a first type of belt rail having a horizontally disposed leg with longitudinally spaced openings and a second type of belt rail having a vertically upstanding portion and a portion formed with longitudinally spaced openings in a vertical face thereof, said end fitting having at least one downwardly extending projection adapted to extend through a selective aperture in the first type of belt rail to fix said end fitting longitudinally and transversely to the first type of belt rail said downwardly extending projection being adapted to extend behind the vertically upstanding projection of the second type of belt rail to fix said end fitting transversely to the second type of belt rail, said end fitting further defining a pocket, a first latch member slidably supported in said pocket for movement between a latched position and a released position, spring means engaging said first latch member for urging said first latch member to its latched position, said first latch member being adapted to underlie the horizontally disposed leg of the first type of belt rail for detachably affixing said end fitting against vertical movement relative to the first type of belt rail, said end fitting having an upstanding portion adjacent its downwardly extending projection, a pivot pin affixed to said upstanding portion, and a second latch member pivotally supported by said pivot pin for movement between a latched position and a released position, said second latch member having a portion adapted to enter into a selected one of the apertures of the second type of belt rail for detachably affixing said end fitting against longitudinal and vertical movement relative to said type of belt rail, said first latch member and said second latch member being supported for movement independent of each other whereby movement of one of said latch members is not accompanied by movement of the other of said latch members, said first latch member having an elongated opening through which a portion of said second latch member extends, said elongated opening being sized to permit movement of either of the said latch members between its respective latched position and released position without corresponding movement of the other latch member.

4,085,686

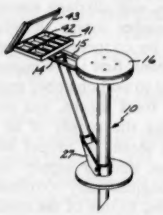
COLLAPSIBLE FISHING STOOL

Raymond R. Turner, 10852 Woodward La., Garden Grove, Calif. 92640; Elton W. Turner, 316 Lenore Trail, Chesapeake, Va. 23320; Jerry Turner, 711 Ballard Dr., Melbourne, Fla. 32935, and Robert J. Winkler, 2101 E. 4th St., Santa Ana, Calif. 92704

Filed Jul. 25, 1977, Ser. No. 818,307

Int. Cl.[2] A47C 7/62

U.S. Cl. 108—25 **6 Claims**



1. A collapsible stool assembly adapted for alternate arrangements comprising:

a first tubular support member;

a first circular collar attached around said first support member proximate the lower end thereof said collar including radially extending pivot pins formed on the exterior thereof;

a seat assembly comprising a first and second elongate brace segment, a circular seat attached to the one ends of said first and second brace segments, storage means attached to the other ends of said brace segments, said first and second brace segments being pivotally attached proximate said one ends thereof to the upper end of said first support member the pivotal axis of said brace segments being substantially parallel to the axis of said pivot pins;

a second tubular support member pivotally attached to said pivot pins at the lower end thereof; and

engagement means formed in said brace segments for engaging the upper end of said second support member when said brace segments are pivoted to an alignment substantially orthogonal relative said first support member.

4,085,687

REMOTE ENVELOPE DEPOSITORY CONSTRUCTION

Robert Beck; Herbert J. Morello, both of North Canton, and Jack M. Richardson, Canton, all of Ohio, assignors to Diebold, Incorporated, Canton, Ohio

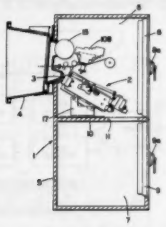
Filed Jan. 12, 1976, Ser. No. 648,281

Int. Cl.[2] G07G 5/00

U.S. Cl. 109—24.1 **6 Claims**

1. In envelope depository construction of a type in which a conveyor transports a deposite envelope from an entry slot in a depository unit and delivers it to a safe-like chest in said unit, and in which printer means prints identifying indicia on the envelope before delivery to the chest; the combination of double, endless, laterally continuous, opposed belt conveyor means having entry and exit ends for transferring an envelope trapped in the bite between said opposed belts from conveyor entry to exit ends; drive means for the conveyor means; entry channel means located adjacent the conveyor entry end; exit channel means located adjacent the conveyor exit end; gate

plate means including a plate member located adjacent each of the conveyor entry and exit ends; means slidably mounting the gate plate members for movement between closed and open positions; means for moving the gate plate members between closed and open positions including a lever pivotally mounted intermediate its ends, one of the lever ends engaging the entry gate plate member and the other lever end engaging the exit gate plate member whereby the exit plate may be moved to open position when the entry plate is moved to closed position and vice versa, spring means engaging the lever normally biasing the lever to hold the entry gate plate member in closed position, solenoid means having an armature connected with the biasing spring means, the solenoid means when energized



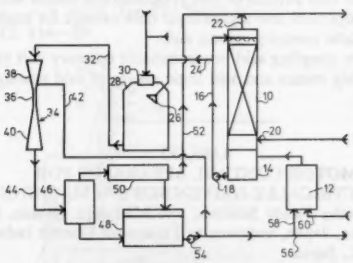
actuating the lever to move the entry gate plate member from closed to open position and when deenergized permitting the biasing spring means to actuate the lever to move the entry gate plate member from open to closed position, a slidably mounted movable cam plate operatively connected with the solenoid armature and the biasing spring means, the cam plate having slot and pin connection with the lever, and the cam slot having a lock portion engaging the pin to lock the entry gate plate member in locked position when the lever is biased to normally closed position by the spring means; and means for energizing the conveyor drive means and the plate moving mean to move the entry gate plate member to open position for accepting a deposited envelope.

4,085,688

TREATMENT OF EFFLUENT

Clive Richard Smith, 2 Bent Lea,, Bradley, Huddersfield, HD2 1QW, and Brian Mills, 14 Victoria Road, Liversedge, West Yorkshire, both of England

Filed Dec. 17, 1975, Ser. No. 641,869
Int. Cl.[2] F23G *7/04*
U.S. Cl. 110—238 **4 Claims**



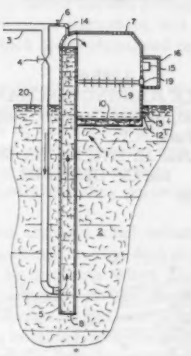
1. A process for incinerating aqueous liquor containing alkali or metal salts which is pre-concentrated by heat exchange from incineration gases, comprising atomising said liquor into droplet form, bringing said liquor in droplet form into direct contact with hot incineration gases to effect partial evaporation of liquor from the surface of the droplets and cooling of said gases, and passing the partially evaporated liquor in the vapor and/or particulate phase to an incineration chamber for incineration of the partially evaporated liquor and the production of hot incineration gases containing substantially all the solid particulate product of the incineration for pre-concentration of subsequently atomised liquor.

4,085,689

FIBROUS FILTER INCINERATOR

Seymour Kershner, 2902 Henley Rd., Norristown, Pa. 19403

Filed Jul. 1, 1976, Ser. No. 701,507
Int. Cl.[2] F23G *5/12*; C02C *1/12*
U.S. Cl. 110—252 **9 Claims**



1. An apparatus for the removal and destruction of fibrous material from a liquid, which comprises:

(a) an incinerator chamber having an upper portion and a lower portion;

(b) air lift pump means for pumping the liquid from a source thereof into said upper portion of said incinerator chamber, said pump means comprising

(i) an elongated air lift pipe means having an open lower end thereof submerged in a source of said liquid and an open uppper end thereof in fluid communication with said upper portion of said incinerator chamber;

(ii) air supply pipe means having a first branch thereof in fluid communication with said air lift pipe means adjacent said submerged open end thereof and a second branch in fluid communication with said upper portion of said incinerator chamber adjacent said upper open end of said air lift pipe means; and

(iii) valve means for selectively controlling the flow of air from said air supply pipe means to said first and second branches thereof;

(c) grid means disposed in said incinerator chamber between said upper and lower portions thereof for filtering the fibrous material from the liquid pumped therein;

(d) means for incinerating the fibrous material while the material is disposed on said grid means; and

(e) means for automatically controlling predetermined time periods for (i) passing air through said first branch of said air supply pipe means so as to pump the fibrous liquid through said elongated air lift pipe means and into said incinerator chamber, (ii) passing air through said second branch of said air supply pipe means directly into said incinerator chamber, and (iii) incinerating the fibrous material disposed on said grid means.

8. A method for removing and destroying fibrous material contained in a liquid, which comprises the steps of:

supplying air to an elongated open-ended pipe which has its lower end submerged in a source of fibrous liquid and its upper end in fluid communication with an incineration chamber such that the air passes upwardly through said pipe and thereby pumps the fibrous liquid through said pipe and into said incinerator chamber;

filtering the fibrous material from the liquid pumped into said incinerator chamber;

periodically, at predetermined intervals and for a medetermined period of time, discontinuing the flow of air into said pipe and passing air directly into said incinerator chamber to force excess liquid to drain from the filtered fibrous material;

incinerating the filtered and drained fibrous material;

cooling said incinerator chamber; and

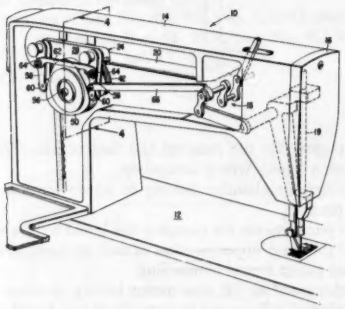
removing any ashes remaining from the incinerating step.

4,085,690

NEEDLE JOGGING MECHANISMS

Reinhold Papajewski, Buchig, Germany, assignor to The Singer Company, New York, N.Y.

Filed Jun. 21, 1976, Ser. No. 697,885
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 R **2 Claims**



1. In a sewing machine having a base, a bracket arm, a needle bar supported for endwise reciprocation and lateral jogging movement in said bracket arm, and a sewing machine drive shaft in said bracket arm for imparting endwise reciprocation to said needle bar, a needle jogging mechanism comprising:

a. a frame located within said bracket arm and attached thereto;

b. a single cam means rotatably journaled in said frame for rotation about its central axis;

c. means for rotating said cam means in timed relation with said sewing machine drive shaft;

d. a pair of follower levers located on opposite sides of the axis of rotation of said cam means;

e. means for pivotally mounting each of said follower levers at points on said frame spaced from each other;

f. a pair of cam followers rotatably attached one to each of said follower lever for tracking substantially diametrically opposite edges of said single cam means;

g. a cross-link extending from one of said follower levers to said other follower lever;

h. means for pivotally mounting said cross-link to each of said follower levers such that said cross-link influences parallel motion of said follower levers in response to the tracking of said cam means by said cam followers;

i. means for adjusting said cam followers toward and away from each other to compensate for wear and variations in the manufacture of said cam means while maintaining a tracking relation on substantially diametrically opposite sides of said cam means; and

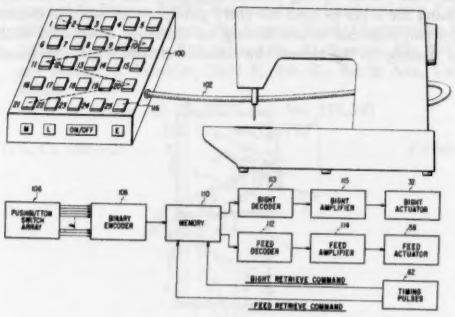
j. means for transferring the parallel motion of said follower levers to said needle bar for moving said needle bar transversed to the direction of material feed.

4,085,691

SEWING MACHINE WITH PROGRAMMABLE MEMORY

Donald Jay Coughenour, Morristown, and Jack Brown, Union, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Jul. 27, 1976, Ser. No. 709,049
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E **9 Claims**



8. A programmable memory unit for a sewing machine having a stitch forming means operative to form successive stitches, including mechanism for influencing the stitch position coordinates of said successive stitches in the formation of a pattern of stitches, logic means responsive to input data representative of stitch position coordinates for producing stitch position coordinate electric signals, actuating means responsive to signals from said logic means for controlling the position of said stitch forming means in accordance with input data fed to said logic means, and means for initiating actuation of successive stitches in the formation of said pattern of stitches, said programmable memory unit comprising:

means responsive to operator manipulation for programming a stitch pattern selected by an operator, said programming means including a plurality of selector buttons with each of said buttons having the capability of generating a digital code corresponding to a stitch position coordinate of a stitch pattern;

read-write static memory means continuously available for storing new digital input data corresponding to stitch position coordinates of a stitch pattern selected by an operator;

encoder means for converting the digital code generated by each of said buttons of said programming means actuated by an operator into digital input data suitable for storing in said static memory means; and,

means for coupling said programmable memory unit to said initiating means and said logic means of said sewing machine.

4,085,692

MOTOR CONTROL APPARATUS FOR ELECTRICALLY-DRIVEN SEWING MACHINE

Katsuji Soeda; Fumio Sakuma, and Mitsuhiro Oyama, all of Sukagawa, Japan, assignors to Yamamoto Electric Industrial Co., Ltd., Japan

Filed Oct. 12, 1976, Ser. No. 731,686
Claims priority, application Japan, Mar. 5, 1976, 51-23882
Int. Cl.[2] D05B *69/22*
U.S. Cl. 112—275 **5 Claims**

1. A motor speed control apparatus for an electrically-driven sewing machine capable of effecting a single stitch, comprising:

a main motor circuit for supplying a motor current from an AC power supply through a main switch and a semiconductor element with a controlled electrode to a motor;

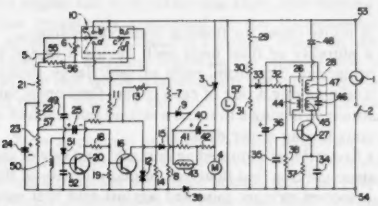
a first control means for controlling said semiconductor element in order to effect normal operation;

a controller adapted to change between a first and a second state to control the speed of said motor continuously when said first control means is energized;

a second control means for controlling said semiconductor element in order to effect a single stitch wherein said controller initiates the operation of the single stitch; and

a change-over means for changing over the operation between said first and said second control means; and

said second control means including means for setting the trigger voltage for turning on said semi-conductor element, a switching element coupled with said trigger-voltage setting means, a bias means for energizing said switch element, and a charge-discharge circuit means, said bias



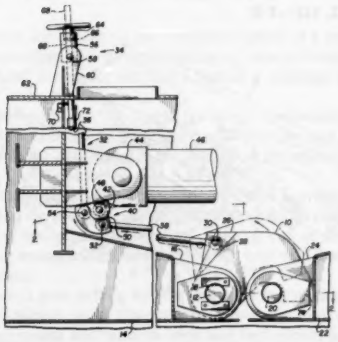
means having a needle position detector means for detecting the position of a needle bar, said bias means supplying said switching element with a first bias to hold said switching element off when said needle position detector means detects the absence of said needle bar at said predetermined position, and supplying said switching element with a second bias sufficient to turn said switching element on when said needle position detector means detects the fact that said needle bar is at said predetermined position, said charge-discharge circuit means preventing said bias means from supplying a sufficient bias to turn said switching element on for a predetermined period of time after said controller is operated to initiate the single stitch operation, said trigger voltage setting means being rendered ineffective by the conduction of said switching means.

4,085,693

MECHANICAL LOCKING DEVICE FOR A LONGITUDINALLY SPLIT BOTTOM DUMP BARGE

Robert R. Seiford, c/o Twin City Shipyard, Inc. P.O. Box 3032, St. Paul, Minn. 55165

Filed Dec. 27, 1976, Ser. No. 754,213
Int. Cl.² B63B *35/30*
U.S. Cl. 114—29 **7 Claims**



1. A device for mechanically locking together first and second halves of a longitudinally split bottom dump barge when the hopper formed by the two halves is closed wherein both halves are pivotable about a common longitudinal axis which is centrally disposed along the top deck of the barge, and the barge includes means for opening and closing the hopper by pulling together, or pushing apart, the respective bottom portions of the two halves, said device comprising:

a first longitudinally extending pin mounted to a bottom portion of the first half of the dump barge;

a second longitudinally extending pin mounted to a corresponding bottom portion of the second half of the dump barge opposite said first pin;

a locking member, having one end journaled to said first pin for pivotal movement thereabout, and an opposite hook-shaped end which hooks about, and rests upon, said second pin; and

positioning and supporting means for said locking member, for pivotally moving the hooked end of said locking member upward to an unlocked position, or downward to a locking position, said positioning and supporting means for said locking member comprises:

a third longitudinally extending pin carried by said locking member;

an operating wheel assembly which includes a housing member pivotably mounted on a top deck of the first half of the dump barge, an operating wheel having an internally threaded hub portion which is supported by and rotatable within said housing member, and an externally threaded shaft extension member which extends through said housing member and is in threaded contact with said operating wheel; and

a locking device operating shaft assembly, which has a lower end journaled to said third pin and an upper end connected to said shaft extension member.

4,085,694

DUAL RUDDER ASSEMBLY

Karl Schilling, and Horst Rathert, both of Minden, Germany, assignors to Werftunion G.m.b.H. & Co., Dortmund, Germany

Filed Mar. 4, 1976, Ser. No. 663,816
Claims priority, application Germany, Mar. 8, 1975, 2510256
Int. Cl.² B63H *25/06*
U.S. Cl. 114—163 **1 Claim**

1. In combination with a ship having a pair of drives generating a pair of parallel screw races passing backwardly parallel to each other to each side of a ship keel plane, the improvement comprising a pair of rudders in each of said races pivotal about parallel pivot axes, the pivot axes of each pair being equispaced to either side of the center of the respective race, each rudder having a central plane lying parallel to said keel plane during normal straight forward travel of said ship, each rudder further having an inner face turned toward the center of the respective screw race and an outer face formed by a convex front portion generally in front of the respective pivot axis and a concave rear portion generally behind the respective axis and forming with the respective central plane an angle of between 2° and 10°, the axis of the rudder of each pair further from said keel plane lying behind the other axis of each pair.

4,085,695

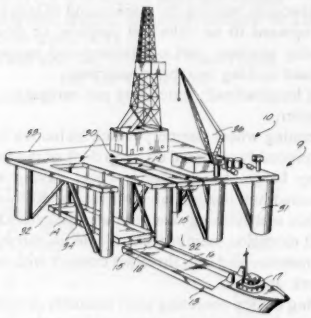
LOGISTICAL SUPPORT OF OFFSHORE DRILLING FACILITIES

John J. Bylo, 7272 Willoughby Ave., Los Angeles, Calif. 90046

Continuation-in-part of Ser. No. 649,645, Jan. 16, 1976, which is a division of Ser. No. 439,375, Feb. 4, 1974, Pat. No. 3,934,532, which is a continuation-in-part of Ser. No. 187,537, Oct. 7, 1971, Pat. No. 3,793,974, which is a continuation-in-part of Ser. No. 794,938, Jan. 29, 1969, abandoned. This application Apr. 19, 1976, Ser. No. 678,079

Int. Cl.[2] B63B *35/40*

U.S. Cl. 114—260 10 Claims



1. Apparatus for logistical support of an offshore drilling facility from a shore-based supply location comprising

1. a plurality of modular work deck units of generally rectangular plan shape and of generally uniform external configuration and dimension over the bottom and lower side and end portions thereof,
2. a self-propelled vessel having an exposed deck portion dimensioned and configured to releasably mate with and to support any one, and only one at any time, of the work deck units and cargo carried thereby in substantially laterally and longitudinally fixed position on the vessel, the vessel including ballast means operable for increasing and decreasing the draft of the vessel when mated with a work deck unit sufficiently that the vessel can ballast down from a separately supported deck unit and move out from thereunder,
3. a plurality of dock facilities at the supply location defined in cooperation with the vessel and the work deck units
   a. for movement thereinto of the vessel with a work deck unit thereon and
   b. for engaging and supporting a work deck unit therein
      i. for loading and unloading of cargo to and from the deck unit, and
      ii. for transfer to and from the vessel in response to ballasting of the vessel,
4. a deck unit-to-vessel receiving and discharging station at the offshore drilling facility,
5. the offshore drilling facility including a platform elevated above the adjacent water surface, and
6. the receiving and discharging station including elevator means at an elevated location in the drilling facility and engageable with a work deck unit, the elevator means being operable for engaging a work deck unit supported by the vessel and for raising and lowering a deck unit to and from a receiving location elevated in the offshore facility above the water surface.

4,085,696

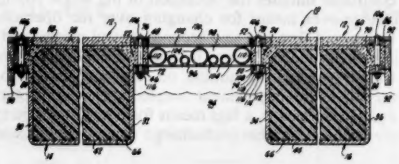
UTILITY CHASE FOR FLOATING UNITS

Myron L. Shorter, Jr., 834 Vallejo Rd., Novato, Calif. 94947

Filed Nov. 1, 1976, Ser. No. 737,496

Int. Cl.[2] B63B *35/44*

U.S. Cl. 114—266 20 Claims



1. A utility chase for floating units comprising:

a. a plurality of float units each having a flange structure projecting therefrom, each of said flange structures extending along a side of each of said float units, said flange structure having a first and a second side, each of said float units having upper deck;

b. a first stringer mounted against said first side of said flange structure of a first float unit of said plurality of float units;

c. a second stringer mounted against said first side of said flange structure of a second float unit of said plurality of float units, said flange structure of said first float unit spaced from said flange structure of said second float unit;

d. at least one bar mounted against said first side of said flange structure of said first float unit, said at least one bar also mounted against said first side of said flange structure of said second float unit, said bar spanning the space between said first and second float units below said upper deck thereof;

e. fastening means for securing, in compression each of said flange structures of said first and second of said plurality of float units, said first and second stringers, and said at least one bar spanning the space between said first and second float units, said fastening means including a rod element extending through each of said first and second stringers and said at least one bar spanning the space between said first and second float units.

4,085,697

ALL-TERRAIN VEHICLE

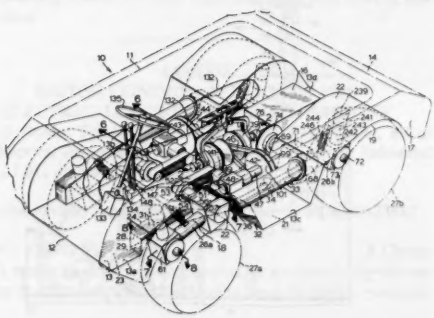
Johannes Leonardus Gaasenbeek, 56, Burns Avenue, RR No. 3, Belleville, Ontario, Canada

Filed Jul. 15, 1976, Ser. No. 705,399

Claims priority, application United Kingdom, Feb. 24, 1976, 07255/76

Int. Cl.[2] B60F *3/00;* B62D *11/04*

U.S. Cl. 115—1 R 10 Claims



1. A self-propelled vehicle having a vehicle body, an engine supported on the body, front and rear ground wheels carried

on the body at each side, at least one ground wheel on each side of the vehicle having suspension means acting between the wheel and the vehicle body for resiliently resisting upward movement of the wheel relative to the body, the wheel being coupled to and driven from one end of a torsional energy storing drive shaft extending longitudinally of the vehicle, means supporting said shaft on the vehicle for pivoting about a transverse axis at the other end of said shaft, a transverse drive shaft supported on the vehicle body at said other end of said longitudinal shaft and driving a speed-reducing drive coupling which drives said longitudinal energy-storing shaft, whereby small instantaneous advancements and retardations of the vehicle wheel and small torques derived from rocking of the wheel and its energy storing shaft about the speed-reducing drive coupling are stored in said energy-storing shaft without being transmitted to said transverse shaft, a transmission between the engine and each transverse shaft, and steering control means operatively connected to the transmissions for varying differentially the speed of a ground wheel on one side of the vehicle and a ground wheel on the opposite side of the vehicle so that one wheel is speeded-up while the other wheel is slowed down, whereby the steering of the vehicle can be effected.

2. A vehicle as claimed in claim 1 having a buoyant watertight body, a tube extending longitudinally along each side of the body and a propeller supported in each tube, the propeller being drivingly connected to the transverse shaft driving the ground wheel on the respective side of the vehicle body.

4,085,698

DEVICE FOR DETECTING ROTATIONAL SPEED OF A TAPE REEL

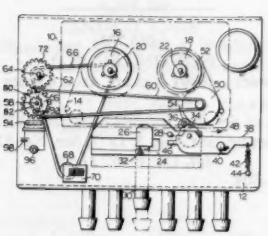
Jirou Kajino, and Naoyuki Ohara, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 16, 1976, Ser. No. 696,701

Claims priority, application Japan, Jun. 19, 1975, 50-75128; Jun. 20, 1975, 50-75970; Jun. 20, 1975, 50-75969

Int. Cl.[2] G08B *5/36;* **G01D** *5/32;* **G11B** *15/18;* **B65H** *25/30*

U.S. Cl. 116—114 J **3 Claims**



1. A device for detecting the rotational speed of a tape reel in a tape recording and/or reproducing apparatus comprising:

tape moving means for moving a tape at a constant speed;

a supply reel;

first rotating means having a frictional mechansim connected to said supply reel for being driven by said supply reel to rotate at a speed in proportion to the speed of said supply reel;

second rotating means connected to said tape moving means for being driven by said tape moving means to rotate at a constant speed greater than the initial speed of said first rotating means and mounted coaxially with said first rotating means;

a first pinion gear driven by said first rotating means;

a second pinion gear mounted rotatably on said second rotating means and meshed with said first pinion gear for being rotated from a first position to a second position when the rotational speed of said first rotating means exceeds the constant speed of said second rotating means;

a magnet fixed on said second pinion gear;

a magnetically sensitive element adjacent said magnet for being actuated by said magnet at the second position of said second pinion gear; and

indicating means responsive to said magnetically sensitive element for indicating that the rotational speed of said supply reel is higher than a predetermined speed when said second pinion gear is rotated to the second position.

4,085,699

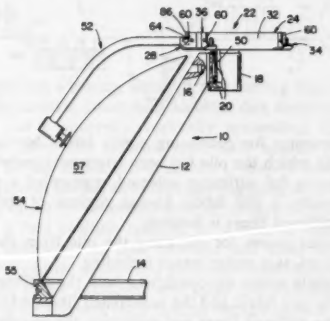
MOUNTING FOR ARMS OF A THIN-FILM APPARATUS

Gunard O. B. Mahl, San Francisco, Calif., assignor to CHA Industries, Menlo Park, Calif.

Filed Mar. 30, 1977, Ser. No. 782,822

Int. Cl.[2] B05C *13/00*

U.S. Cl. 118—500 **2 Claims**



1. In a thin-film deposition apparatus comprising a rotatable means, a plurality of racks, each having a circular outer periphery, a plurality of arm means, each rack being rotatably mounted relative to an arm means, each arm means being operatively associated with the rotatable means, and means for imparting rotary motion to the racks about their centers, responsive to rotation of the rotatable means, the improvement comprising:

means operatively coupling each arm means and the rotatable means for allowing removal of an individual arm means from the rotatable means, said means operatively coupling each arm means and the rotatable means comprising a first arm means portion removably seatable in a first depression defined by the rotatable means and a second arm means portion removably seatable in a second depression defined by the rotatable means, the rotatable means supporting said first and second arm means portion each arm means being generally T-shaped in configuration with the oppositely extending limbs of the generally T-shaped arm means defining the first and second arm means portion, the first and second depressions being generally U-shaped in configuration and positioned such that the first and second arm means portions are positioned to rest in the first and second generally U-shaped impressions under the weight of the arm means, the rotatable means defining a plurality of pairs of spaced apart flange means, each pair of flange means defining a respective first and second depression; and

means supported by said flange means for resisting torque forces applied to said arm means while allowing substantially unrestricted insertion and removal of said arm means, said torque forces resisting means comprising a plurality of rods each pivotally mounted adjacent the ends thereof in each respective of the pairs of flanges substantially parallel to the oppositely extending limbs of the respective T-shaped arm means and a pair of hook means attached to extend laterally from each respective rod with a concave side of each of said hook means facing away

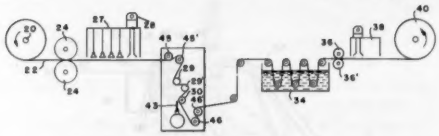
from the respective rod to form pairs of aligned mouths, the aligned mouths being positioned to contact respective oppositely extending limbs of the respective generally T-shaped arm means as said first and second arm means portions thereof are seated in said respective first and second depressions.

4,085,700

APPARATUS FOR SCULPTURING PILE FABRICS

Walter Engels, Tryon, N.C., and Charles E. Willbanks, Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Dec. 15, 1976, Ser. No. 750,888
Int. Cl.[2] D06C *23/02*
U.S. Cl. 118—37 **11 Claims**



1. Apparatus for producing a pile fabric having selected regions in which the pile has been trimmed, comprising:

(a) means for stiffening selected regions of a pile fabric whereby a pile fabric having regions of stiffened and unstiffened fibers is formed;

(b) cutter means for trimming the pile from the stiffened regions, said cutter means including:

(i) blade means for contacting both the stiffened fibers in the pile fabric and the unstiffened fibers while severing the stiffened fibers and deflecting the unstiffened fibers without severing them, said blade means cutting in the same fashion as a knife or razor as opposed to cutting like a pair of scissors;

(ii) support means closely adjacent to said blade means for maintaining said pile fabric in contact with said blade means; and

(iii) means for effecting relative motion between said blade means and said pile fabric, and

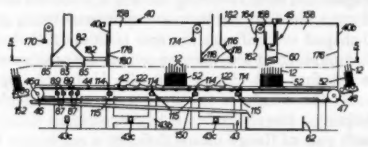
(c) means for supplying said pile fabric having regions of stiffened and unstiffened fibers to said cutter means.

4,085,701

APPARATUS FOR WAX IMPREGNATION

George Anson, Armadale, and John Liberts, Clayton, both of Australia, assignors to Andax Pty. Ltd., Australia

Filed Nov. 20, 1974, Ser. No. 525,358
Claims priority, application Australia, Feb. 28, 1974, PB6766
Int. Cl.[2] B05C *5/00, 7/02, 13/02*
U.S. Cl. 118—57 **7 Claims**



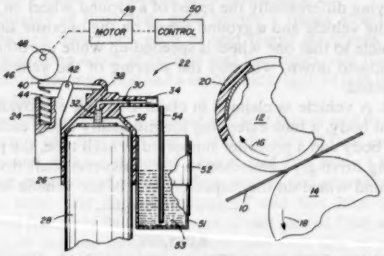
1. Apparatus for applying liquid settable material to a board product formed from board having substantially straight parallel open-ended internal interstices, said apparatus comprising, flow means for generating a zone of cascading flow of said material and generally horizontal conveyor means for passing the board product thereon through said zone with said interstices in a substantially vertical position and open to said flow, clearance means for clearing excess liquid settable material from said interstices after the board product has passed through said flow means, said clearance means including an inclined ramp adjacent said conveyor means over which said product is caused to move as it is carried by said conveyor means, said ramp being upwardly inclined in the direction of travel and having an upper end, whereby the board product is subjected to jolting pursuant to termination of downward movement of the board product after it passes over the upper end of the ramp.

4,085,702

OFFSET PREVENTION DURING FIXING

James William Consaul, East Rochester, and Thomas Arthur Jadwin, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,875
Int. Cl.[2] G03G *15/20*
U.S. Cl. 118—60 **6 Claims**



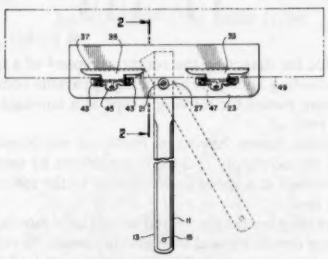
1. In a device for contact fixing electrostatic marking particles carried on a support material, said fixing device being of the type including a member having a fixing surface and a container for a supply of offset preventing material, the improvement comprising applicator means for distributing offset preventing material having a viscosity of at least approximately 10,000 centistokes from said container onto the fixing surface of the member without physically contacting the fixing surface of the member by said applicator means.

4,085,703

PAINTING SHIELD

Frank J. Glowacki, 10801 Vickers Ave., Garden Grove, Calif. 92640

Continuation of Ser. No. 670,599, Mar. 26, 1976, abandoned. This application Aug. 3, 1977, Ser. No. 821,265
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—504 **3 Claims**



1. Apparatus for shielding protected areas during spray painting operations, comprising:

an elongate handle, one end of which includes a gripping portion, the other end of which includes an aperture normal to the longitudinal axis of said handle;

a rigid, flat reinforcing member having a length and width shorter than the length of said elongate handle, said rein-

forcing member lying flat against the side of said handle at said other end of said handle, said reinforcing member lying in a plane parallel to the longitudinal axis of said elongate handle, said reinforcing member including an aperture corresponding with said handle aperture;

a pivot shaft passing normal to the longitudinal axis of said handle through said handle aperture and said reinforcing member aperture to permit said handle to pivot freely to any position in a 180° arc within a plane parallel to the plane defined by said reinforcing member; and

a painting shield, formed of thin sheet material, removably attached to said flat reinforcing member and extending beyond said reinforcing member on at least one side thereof, the plane defined by said painting shield, the plane defined by said reinforcing member, and the plane defined by the pivoting movement of said handle all being parallel to each other and perpendicular to said pivot shaft.

4,085,704

ANIMAL LITTER

Stephen E. Frazier, Orlando, Fla., assignor to Rush-Hampton Industries, Longwood, Fla.

Filed Nov. 30, 1976, Ser. No. 746,020
Int. Cl.² A01K *29/00*
U.S. Cl. 119—1 **16 Claims**

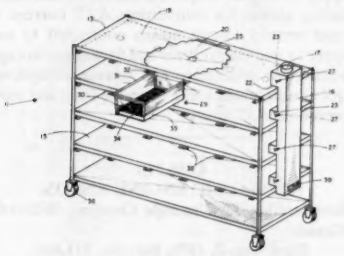
1. An animal litter which slowly, continuously and uniformly releases an odor control agent comprising a suitable absorbent material admixed with from about 1% to about 50% by weight of a highly porous, chemically inert silica gel or mullite vehicle which has been previously impregnated with from about 1% to about 50% by weight of an odor control agent.

4,085,705

ANIMAL CAGE

Thomas M. Gland, and Robert C. A. Frederickson, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 17, 1976, Ser. No. 724,429
Int. Cl.² A01K *1/00*
U.S. Cl. 119—17 **7 Claims**



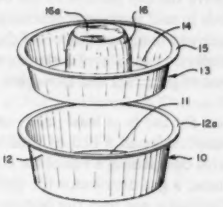
1. A portable animal cage rack having a plurality of shelves with each shelf supporting a plurality of animal cages which are removably suspended on the shelf's underneath side, a main air duct mounted on one end of the shelves, a branch air duct in each shelf connected to said main air duct, an opening in said main air duct or one of said branch air ducts adapted for connection to an exhaust system, and an exhaust opening in each said branch air duct directly over a supported animal cage for transmitting air from an animal cage into said branch air duct.

4,085,706

COMBINED ANIMAL WEANING, WATERING AND FEEDING DISHES

Virginia Sunner Evans, 3471 S. Park Rd., Bethel Park, Pa. 15102

Filed Dec. 27, 1976, Ser. No. 754,190
Int. Cl.² A01K *5/00*
U.S. Cl. 119—61 **4 Claims**



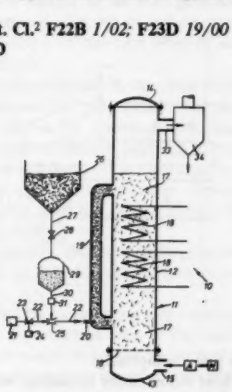
1. A combined weaning, watering and feeding dish for puppies and like animals, comprising an outer dish member having a bottom and a generally vertically upstanding rim fixed thereto, an inner dish member removably spaced from the outer dish having an annular generally U-shaped trough with an outer sidewall having an outer edge engaging the top of the upstanding rim of the outer dish member to support it centrally therein in a first position adapted to contain a temperature stabilizing means in the area between said inner and outer dishes, and a central upstanding generally cylindrical member in the center of the annulus of said inner dish member spaced from said outer sidewall by a bottom trough surface and extending above the outer edge of said inner dish, said cylindrical member having a flat top closure adapted to support the inner dish in an inverted second position removed from the outer dish member whereby the bottom trough surface of said inner dish acts as an ear protective water dish by diverting a dog's ears away from the cylindrical member in said inverted position.

4,085,707

COMBUSTION OR PART-COMBUSTION IN FLUIDIZED BEDS

Gerald Moss, Oxford, England, assignor to Exxon Research & Engineering Co., Linden, N.J.

Filed Feb. 12, 1976, Ser. No. 657,540
Claims priority, application United Kingdom, Feb. 14, 1975, 6355/75
Int. Cl.² F22B *1/02*; F23D *19/00*
U.S. Cl. 122—4 D **25 Claims**



1. A method of at least partly combusting a solid or semi-solid fuel at an elevated temperature in a bed containing particles which are fluidized by an upwardly passing gas capable of

converting the fuel to at least partly combusted gaseous products at the elevated temperature, comprising passing a mixture comprising the fuel and non-combustible fluidizable particulate solids into a bottom region of the bed so that the fuel when within the bed is dispersed at least among the particulate solids whereby the conversion of the fuel is effected in an extended portion of the bed volume, and causing or permitting particles to leave a top region of the bed, wherein at least some of the particles which leave the top portion of the bed are employed as particulate solids in said mixture comprising fuel and particulate solids, whereby to maintain the top of the bed at approximately a substantially constant level and promoting a generally upward movement of particles and any other materials in the bed.

17. An apparatus for use in at least partly combusting a fuel at an elevated temperature in a bed of fluidizable particulate solids, the apparatus comprising a vessel for containing the bed in a selected volume, a gas distributor for distributing an oxygen-containing fluidizing gas into the bottom of said volume substantially uniformly across the horizontal cross-section of the bottom of said volume, a conduit above the top of said volume through which gas leaving the volume can pass out of the vessel, at least one duct having an upper end open to a top region of the bed volume and a lower end open to a bottom region of the bed volume so as to provide communication through the duct between top and bottom regions of the bed volume, the duct being so constructed and/or arranged that substantially no fluidizing gas will pass thereinto from said volume and so that said particulate solids will enter the upper end of the duct and pack therein to a greater apparent density than the apparent density of said bed contained in said volume and a fuel supply means for passing fuel into the bottom region through the lower end of the duct whereby to mix the fuel with solids at the lower end of the duct and to cause the resulting mixture of solids and fuel to pass into the bottom region of the bed volume so as to disperse the fuel among the particulate solids in the bottom region of said bed volume.

4,085,708

STEAM BOILERS

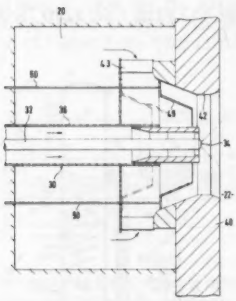
Ronald Arthur Ashdown, Redhill, England, assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Feb. 4, 1977, Ser. No. 765,566

Claims priority, application United Kingdom, Feb. 18, 1976, 6464/76

Int. Cl.[2] F22B *1/18*; F23J *5/00*

U.S. Cl. 122—7 B **4 Claims**



1. A power plant comprising:

(i) a waste heat steam boiler including walls defining a furnace, one of said walls having an opening formed therethrough,

(ii) at least one fuel burner associated with said one furnace wall, one end of said burner adjacent said opening in said one wall,

(iii) an air blower for supplying primary combustion air to said fuel burner,

(iv) a windbox disposed adjacent said one wall to which secondary combustion air can be passed for supplying said burner,

(v) a gas turbine including an exhaust section for passing heated exhaust gases including air from said turbine,

(vi) a forced draught fan,

(vii) means for supplying the exhaust from said turbine or the output from said forced draught fan to said windbox for use as secondary combustion air to be supplied to said burner,

(viii) a throat associated with said opening in said one wall and adjacent said burner through which combustion products pass into said furnace, secondary combustion air passed into said throat from said windbox, and

(ix) means for adjusting said throat between an open full quarl position when said secondary air is the exhaust from said turbine and a partially closed position where the effective quarl diameter is reduced when said secondary air is supplied by the forced draught fan.

4,085,709

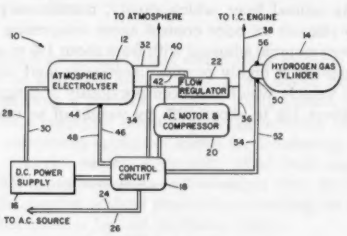
HYDROGEN FUEL SYSTEM FOR A VEHICLE

Kuldip Chand Tangri, 5126 W. Concord, Chicago, Ill. 60639

Filed Dec. 4, 1975, Ser. No. 637,736

Int. Cl.[2] F02B *43/10*

U.S. Cl. 123—1 A **12 Claims**



1. A hydrogen fuel system for a vehicle powered by an internal combustion engine, said system being mounted on the vehicle and comprising gas storage means for storing hydrogen gas, said storage means being connected to a fuel input for the internal combustion engine, an electrolyzer for generating hydrogen gas which is stored in said gas storage means, a D.C. power supply having an output connected to said electrolyzer and including means for converting A.C. current to D.C. current, and control circuit means connected to said D.C. power supply to said electrolyzer and to said gas storage means for controlling the generation and storage of hydrogen gas, said control circuit means being operable from and connectible to a conventional A.C. source.

4,085,710

HYDRAULIC ENGINE PISTON

Sundar Savarimuthu, 17 Gleneagle Crescent, Willowdale, Ontario, Canada

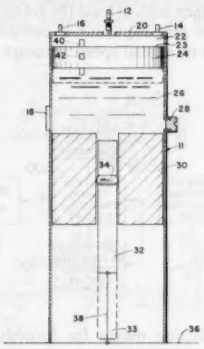
Filed Aug. 3, 1976, Ser. No. 711,404

Int. Cl.[2] F02B *71/00*; F15B *21/00*

U.S. Cl. 123—19 **1 Claim**

1. A two piston hydraulic fluid separated internal combustion cylinder system having fuel admission means, comprising a first piston, a second piston, said second piston having a smaller diameter than said first piston, said first piston and said second piston being co-axially aligned, said first piston and said second piston being housed in a common cylinder, a first cavity located in said cylinder, said first piston being housed slidably in said first cavity, said fuel admission means coupled to said first cavity, a first side of said first piston being disposed

opposite said fuel admission means, a second cavity, said second cavity being disposed in said cylinder, a second piston being disposed slidably mounted in said second cavity, the second side of said first piston being disposed facing said second cavity, a first side of said second piston being disposed facing said second side of said first piston, hydraulic oil, said hydraulic oil being disposed filling said second cavity, the second side of said second piston being disposed coupling a crank shaft, a plug, said plug being disposed in said first cavity, a viewing window, said viewing window being disposed in a



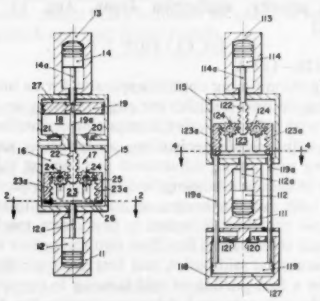
wall of said window at a location in said second cavity, guiding means for guiding said first piston within said first cavity, a cylindrical block, said cylindrical block being disposed located in said cylinder and having an opening therein, said opening for guiding said second piston therein, said means to guide said first piston including a groove extending along a portion of the length of said wall of said cylinder in said first cavity, said first piston having a mating protrusion extending outwardly therefrom, said mating protrusion being disposed engaging said groove.

4,085,711

FREE PISTON ENGINE WITH OPPOSED CYLINDERS

Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435

Filed Sep. 12, 1975, Ser. No. 612,710
Int. Cl.² F02B *71/00, 75/06*
U.S. Cl. 123—46 B **7 Claims**



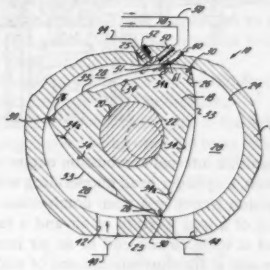
1. A free piston engine comprising a pair of opposed and axially spaced apart cylinders on a common longitudinal axis, a first power piston in one of said cylinders, a second power piston in the other of said cylinders, an energy absorbing device operably connected to and movable with said first power piston, and motion reversing, synchronizing and counterbalancing means centered on said axis and operably interconnecting said energy absorbing means and said second power piston, said synchronizing and counterbalancing means including a double rack, a pair of spaced gears with one gear each engaging one side each of said double rack and a pair of spaced and rigidly interconnected racks also engaging said gears on opposite sides of said double rack and pair of gears and said cylinders being arranged to fire simultaneously so that each power piston will exert a force in the same direction on said energy absorbing device to cause it to move in one direction.

4,085,712

ROTARY ENGINE WITH PILOT AND MAIN FUEL NOZZLES DOWNSTREAM OF TOP CENTER

David M. Myers, Upper Saddle River, and Harold D. Lamping, Oakland, both of N.J., assignors to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Feb. 14, 1977, Ser. No. 768,050
Int. Cl.² F02B *53/10*
U.S. Cl. 123—205 **6 Claims**



1. A rotary combustion engine comprising:

a. an outer body having an internal cavity, the inner peripheral surface of which has a multi-lobe profile such that the junctions of said lobes are disposed relatively close to the engine axis;

b. an inner body of generally polygonal profile having a plurality of apex portions mounted for relative rotation within said outer body cavity with the apex portions of said inner body having sealing cooperation with said multi-lobe peripheral surface to form a plurality of working chambers between the peripheral surfaces of said inner and outer bodies, which chambers vary in volume in response to said relative rotation;

c. said outer body having an air inlet port and an exhaust outlet port disposed adjacent to and on opposite sides of one of the junctions of the two lobes of said multi-lobe peripheral surface;

d. a first fuel nozzle mounted on the outer body adjacent to and on the downstream side, relative to the direction of inner body rotation, of a second lobe junction of said multi-lobe peripheral surface adjacent to which combustion takes place and disposed to discharge its fuel through said surface in a generally upstream direction into each working chamber after the charge therein has been substantially compressed;

e. an igniter mounted on the outer body adjacent to said first fuel nozzle for igniting fuel discharging from said nozzle; and

f. a second fuel nozzle mounted on said outer body adjacent to and on the downstream side of the said second lobe junction and disposed to discharge its fuel through said surface into each working chamber also after the charge therein has been substantially compressed for ignition by the burning of the fuel discharged from said first nozzle, a major portion of the fuel discharging from said second nozzle being directed in a generally upstream direction into each working chamber.

4,085,713

TORCH IGNITION INTERNAL COMBUSTION ENGINE

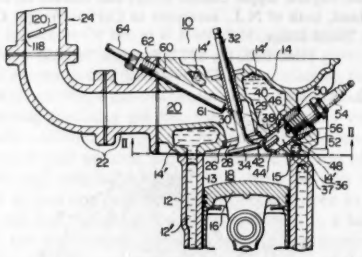
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation-in-part of Ser. No. 445,785, Feb. 25, 1974, Pat. No. 3,982,504. This application Jul. 1, 1976, Ser. No. 701,863

Claims priority, application Japan, Feb. 27, 1973, 48-23926; Nov. 6, 1973, 48-124663; Nov. 13, 1973, 48-127952; Nov. 23, 1973, 48-131836; Jul. 4, 1975, 50-83048; Aug. 9, 1975, 50-96773

Int. Cl.[2] F02B *23/00*

U.S. Cl. 123—75 B **6 Claims**



1. A torch ignition internal combustion engine comprising a cylinder, a piston, a cylinder head cooperating with said cylinder and said piston to define a main combustion chamber for the combustion of a lean mixture of air and a fuel, an intake port connected at its upstream end to an air intake pipe and having a valve seat at the downstream end of said intake port, an intake valve movably positioned with respect to said valve seat, an auxiliary combustion chamber formed of a pot-shaped cavity having at least one suction aperture positioned near to said valve seat and at least one discharge aperture, said suction and discharge aperture being always communicated with said main combustion chamber during the time when said intake valve is closed, said suction aperture being adapted to be communicated with said intake port through a part of said main combustion chamber when said intake valve is opened, an ignition plug having a set of electrodes disposed in said pot-shaped cavity, a fuel injection nozzle having a discharge orifice disposed within said intake port upstream of said intake valve for discharging the fuel at a pressure higher than the atmospheric pressure, and means for continuously supplying the fuel to said fuel injection nozzle so that the fuel is continuously discharged from said discharge orifice into said intake port, said discharge orifice being positioned within said intake port such that an amount of the fuel discharged by said fuel injection nozzle during an intake stroke of each cycle of engine operation is moved through said intake port and through said part of said main combustion chamber toward said suction aperture of said pot-shaped cavity.

4,085,714

ELECTRONIC IGNITION TIMING ADJUSTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

Tadashi Hattori; Minoru Nishida, and Yoshiki Ueno, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 25, 1976, Ser. No. 670,108

Claims priority, application Japan, Apr. 14, 1975, 50-45684

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 R **6 Claims**

1. An electronic ignition timing adjusting system for an internal combustion engine comprising:

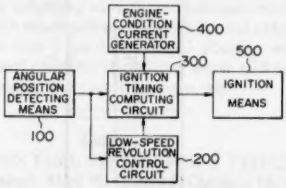
angular position detecting means for detecting two different angular positions of the crankshaft of an engine to generate a first detection signal at one end of said two angular positions and a second detection signal at the other of said two angular positions which is preset to correspond to a minimum ignition advance angular position;

a capacitor;

charging means for charging said capacitor during a period from the generation of said second detection signal until the generation of said first detection signal;

discharging means for beginning to discharge said capacitor upon generation of said first detection signal;

engine condition detecting means for detecting at least the rotational speed of said engine to control either one of a charging current and a discharging current of said capacitor in accordance with at least the rotational speed so that discharging of said capacitor is completed in a shorter period as said rotational speed becomes higher;



discharge completing means for forcibly completing the discharging of said capacitor in response to the generation of said second detection signal when the discharging of said capacitor has not been completed upon the generation of the same; and

ignition signal generating means for generating an ignition signal when the discharging of said capacitor has been completed, whereby ignition advance angular position is determined to coincide with said minimum ignition advance angular position when said rotational speed is lower than a predetermined value and to become greater than said minimum ignition advance angular position as said rotational speed becomes higher than said predetermined value.

4,085,715

IGNITION TIMING CONTROL SYSTEM

Syoichi Otaka, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 6, 1976, Ser. No. 712,347

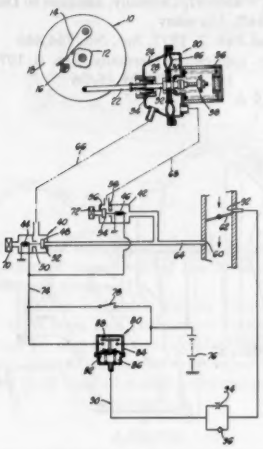
Claims priority, application Japan, Aug. 11, 1975, 50-109915[U]

Int. Cl.[2] F02P *5/04*

U.S. Cl. 123—117 A **1 Claim**

1. An ignition timing control apparatus for an internal combustion engine on a vehicle, the engine having an intake passageway with a throttle valve, comprising: a distributor having a timing adjustment mechanism, an actuator assembly for positioning said timing adjustment mechanism, said actuator assembly including a housing, a diaphragm, an actuator fixed to move with said diaphragm, an outlet in the intake passageway below the throttle valve, a first drive mechanism for driving said actuator in a first direction responsive to increased engine vacuum at said outlet, said first drive mechanism being defined by a first portion of said housing in cooperation with said diaphragm, a second drive mechanism for driving said actuator in a second direction responsive to increased engine vacuum at said outlet, said second drive mechanism being defined by a second portion of said housing in cooperation with said diaphragm, linkage for coupling said actuator to said timing adjustment mechanism such that movement of said actuator in said first direction will advance said timing adjustment mechanism, and movement of said actuator in said second direction will retard said timing adjustment mechanism, control valve means including a first valve assembly, a second valve assembly, a vacuum passageway extending from said

outlet, said first valve assembly including a first valve, a first actuating solenoid, first biasing means, said first valve connecting said first drive mechanism to said vacuum passageway when said first actuating solenoid is energized and to atmosphere by said first biasing means when said first actuating solenoid is de-energized, said second valve assembly including a second valve, a second actuating solenoid, second biasing means, said second valve connecting said second drive mechanism to atmosphere when said second actuating solenoid is energized, and to said vacuum passageway by said second biasing means when said second actuating solenoid is de-energized, valve actuator means including a cruise switch for energizing said actuating solenoids when the internal combustion



engine is operating under steady state driving conditions, said cruise switch including a vacuum actuated switch, an opening slightly above said throttle valve in said intake passageway, a vacuum line extending from said opening, two-way valve means positioned in said vacuum line, said two-way valve means including parallel passageways, a restrictive orifice in one of said parallel passageways, a check valve in the other of said parallel passageways, said two-way valve means allowing slow vacuum build-up in said vacuum actuated switch and allowing fast vacuum release in said valve actuated switch, and a vehicle velocity switch for energizing said actuating solenoids when the vehicle attains a preselected velocity, said control valve means being actuated by either of said vehicle velocity switch and said cruise switch.

4,085,716

INTERNAL COMBUSTION ENGINE WITH AIR-FUEL RATIO CONTROL DEVICE

Hidehiro Minami, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Mar. 15, 1976, Ser. No. 666,671

Claims priority, application Japan, Mar. 20, 1975, 50-38592[U]; Mar. 20, 1975, 50-38598[U]

Int. Cl.[2] F02M *7/00*; F02B *33/00*

U.S. Cl. 123—119 EC **3 Claims**

1. An internal combustion engine having a combustion chamber comprising:

a carburetor for supplying an air-fuel mixture into the combustion chamber, including an air-fuel mixture induction passage with a venturi portion, a float bowl, a throttle valve rotatably disposed within said air-fuel mixture induction passage for providing communication with the combustion chamber, a main discharge nozzle opened at the venturi portion located upstream of the throttle valve, a main well communicating with the main discharge nozzle and communicating with the float bowl of the carburetor, a main air bleed communicating with the main well, and an auxiliary air bleed communicating with the main well;

actuating means for taking a first state in which the flow amount of air supplied into the main well through the auxiliary air bleed is increased to a value greater than a predetermined level and a second state in which the flow amount of the same air is decreased to a value less than the predetermined level, said actuating means including

a cup-shaped cover,

a diaphragm covering the open portion of said cup-shaped cover and defining an operating chamber thereinside,

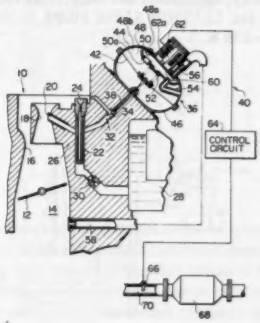
a needle valve fixedly connected to said diaphragm and the valve head to open or close the auxiliary air bleed,

a partition wall disposed to divide the operating chamber into a first chamber defined by the closed portion of said cup-shaped cover, and a second chamber defined by the diaphragm, said partition wall having a restricted opening therethrough for communicating the first chamber with the second chamber,

a return spring disclosed in the second chamber between said partition wall and said diaphragm to urge the valve head of said needle valve in a direction to close the auxiliary air bleed,

means defining an air inlet open to the first chamber and communicating with the atmosphere,

means defining a vacuum inlet open to the first chamber and an opening thereof being opposed to an opening of said air



means defining said inlet, said means defining said vacuum inlet communicating with a portion of the air-fuel mixture induction passage located downstream of the throttle valve of said carburetor,

a swingable valve member made of a plate spring, disposed in the first chamber and fixed at one end thereof to the inner wall of the closed portion of said cup-shaped cover, the other end of the valve member being located between the openings of said means defining an air inlet and said means defining a vacuum inlet to close either of the openings of said means defining an air inlet and said means defining a vacuum inlet, said other end of the valve member normally being urged to close the opening of said means defining a vacuum inlet,

a solenoid actuator electrically connected to said control circuit and sealingly disposed at the closed portion of said cup-shaped cover, said solenoid actuator having an actuating rod projectable to push the valve member to open the opening of said means defining a vacuum inlet and to close the opening of said means defining an air inlet when the solenoid of the solenoid actuator is energized, and to be withdrawn to allow the valve member to close the opening of said means defining a vacuum inlet and open the opening of said means defining an air inlet when the solenoid of said solenoid actuator is de-energized;

a control circuit electrically connected to said actuating means to generate a first operating signal for placing the

actuating means in the first state and a second operating signal for placing the actuating means in the second state, the first and second operating signals comprising an energizing signal for energizing the solenoid of the solenoid actuator of said actuating means and a de-energizing signal for de-energizing the solenoid of the same solenoid actuator; and

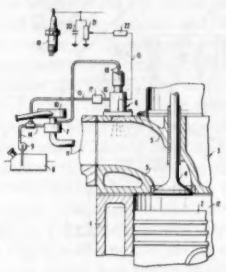
an exhaust gas sensor disposed in the exhaust system of the engine and electrically connected to the control circuit to generate a first information signal for causing the control circuit to generate the first operating signal when exhaust gases from the combustion chamber have a first composition correspond to a condition where the combustion chamber is fed with an air-fuel mixture richer than a predetermined level, and a second information signal for causing the control circuit to generate the second operating signal when the exhaust gases have a second composition corresponding to a condition where the combustion chamber is fed with an air-fuel mixture leaner than the predetermined level.

4,085,717

ATOMIZATION DEVICE FOR INTERNAL COMBUSTION ENGINES

Karl Willmann, Buchenbach, and Helmut Säufferer, Esslingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed May 7, 1976, Ser. No. 684,194
Claims priority, application Germany, May 13, 1975, 2521141
Int. Cl.[2] F02B *51/04*; F02M *29/00*
U.S. Cl. 123—119 E **45 Claims**



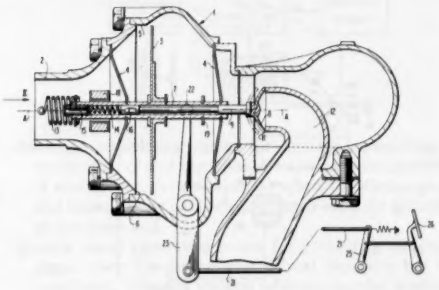
1. An atomization installation for internal combustion engines for the atomization of fuel in an air stream, comprising a first internal combustion engine space means and a second atomization space means separate from said first space means and traversed by at least a part of the combustion air, an electrically conductive fuel supply means projecting into said second atomization space means and terminating therein, counter-electrode means electrically insulated with respect to the fuel supply means and arranged at a distance opposite to the fuel supply means, and means for applying a high voltage potential between the fuel supply means and the counter-electrode means, wherein said fuel supply means includes a plurality of small capillary tube means electrically connected with each other, mounting means for said small capillary tube means, said small capillary tube means freely projecting into said atomization space means from said mounting support means, fuel being able to flow through said small capillary tube means, said capillary tube means forming part of the fuel supply means, the counter-electrode means and being arranged facing with the electrode surface thereof the discharge openings of the small capillary tube means, and air guide means for guiding the air as regards flow velocity and flow direction at least within the area of the counter-electrode means in such a manner that the forces aerodynamically exerted on the atomized and electrically charged droplets by the flowing air predominate with respect to the electrostatic attracting forces exerted on the droplets by the counter-electrode means and thereby are operable to keep the droplets away from the counter-electrode means.

4,085,718

EXHAUST GAS RETURN SYSTEM FOR AUTO-IGNITING INTERNAL COMBUSTION ENGINES

Christian Schaal, Walddorf, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Feb. 2, 1977, Ser. No. 764,840
Claims priority, application Germany, Feb. 6, 1976, 2604604
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **31 Claims**



1. An exhaust gas return installation for auto-ignition internal combustion engines for admixing a part of the exhaust gases to the sucked-in air, characterized by a control means including a spring-loaded baffle disk means acted upon by the suction air stream and a valve means acted upon by the exhaust counterpressure for controlling the exhaust gas admixture at least approximately corresponding to output and rotational speed of the internal combustion engine.

4,085,719

VAPOR PRESSURE REGULATOR FOR A VAPORIZED LIQUID FUEL SYSTEM

Douglas R. Hamburg, Birmingham, and Dante S. Giardini, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 23, 1976, Ser. No. 660,285
Int. Cl.[2] F02B *43/00*
U.S. Cl. 123—122 E **5 Claims**

1. A reservoir for storage of a vaporized fuel which is liquid at standard temperature and pressure comprising in combination:

housing means;

movable wall means received within said housing means cooperative with said housing means to define a variable volume vapor storage zone;

inlet fluid conduit means communicating in fluid tight relation with said vapor storage zone;

outlet fluid conduit means communicating in fluid tight relation with said vapor storage zone;

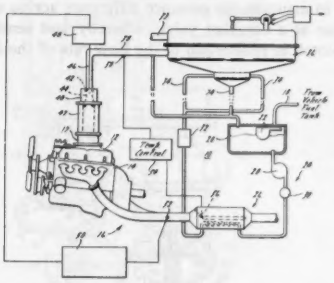
said inlet fluid conduit means operative to communicate said vapor storage zone with a source of vaporized liquid fuel and said outlet fluid conduit means operative to communicate said vapor storage zone with a vaporized liquid fuel utilization means;

reference means communicating the nonvapor side of said movable wall means with a preselected reference pressure

whereby the vapor pressure may be arranged to have a predetermined relationship with respect to the reference pressure;

cup-shaped condensate collection means dependent from said housing means arranged for fluid communication with a reservoir of the liquid fuel;

said inlet fluid conduit means being attached to said condensate collection means whereby higher temperature inlet



vapor from said inlet fluid conduit means may elevate the temperature of vapor within the lower portions of the vapor storage zone; and

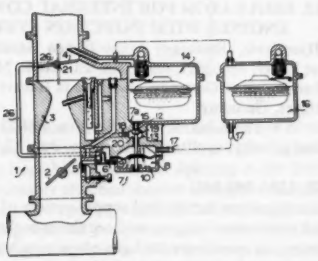
thermally floating separator means received within and spaced apart from said condensate collection means and supported by said inlet fluid conduit means operative to provide a thermal barrier between vapor flowing through said inlet fluid conduit means and condensed vapor.

4,085,720

FUEL SUPPLY SYSTEM FOR MULTI-FUEL INTERNAL COMBUSTION ENGINES

Motoaki Etoh, Ageo, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 11, 1976, Ser. No. 713,513
Int. Cl.[2] F02M *13/00, 13/04, 13/08*
U.S. Cl. 123—127 **3 Claims**



1. A fuel supply system for multi-fuel internal combustion engines, comprising

a carburetor having an intake passage, and a throttle valve operatively disposed in said intake passage,

a first fuel chamber for first fuel,

a second fuel chamber for second fuel,

fuel feeding passages means for respectively feeding the fuels from said first and second fuel chambers, respectively, to said carburetor, said fuel feeding passages means defining closable ports, respectively, communicating with said first and second fuel chambers, respectively,

a selector valve means for selectively opening and closing said ports of said fuel feeding passages means,

a vacuum actuator means for operating said selector valve means,

a first passage communicating said vacuum actuator means with the intake passage at a position adjacent, above and upstream of a closed position of said throttle valve,

said selector valve means upon communication with atmosphere pressure for opening one of said ports communicating with said first fuel chamber for the first fuel and upon communication with a negative pressure for opening the other of said ports communicating with said second fuel chamber for the second fuel,

a branch passage connected to said first passage,

another valve means provided in said branch passage for communicating said branch passage to atmosphere, and

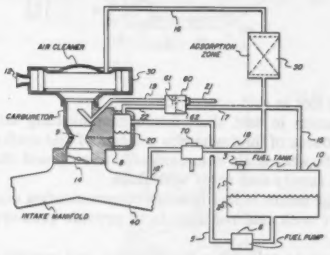
means for operating said another valve means to open itself and said branch passage to atmosphere in the cold.

4,085,721

EVAPORATION PURGE CONTROL DEVICE

Joseph Vardi, and Milton J. Kittler, both of New York, N.Y., assignors to Exxon Research & Engineering Co., Linden, N.J.

Continuation of Ser. No. 773,480, Nov. 5, 1968, abandoned, and a continuation-in-part of Ser. No. 548,702, May 9, 1966, abandoned. This application Jun. 16, 1976, Ser. No. 696,535
Int. Cl.[2] F02M *37/00*
U.S. Cl. 123—136 **8 Claims**



1. In a fuel vapor recovery process for an internal combustion engine fuel system including adsorption means for adsorbing and storing fuel vapor otherwise released to the atmosphere from the engine fuel system, the steps comprising:

(a) desorbing said adsorption means of stored fuel vapors by passing atmospheric air therethrough;

(b) directing said atmospheric air and desorbed fuel vapors to said internal combustion engine for combustion therein; and

(c) controlling as a function of exhaust manifold pressure, the flow of atmospheric air through said adsorption means to permit desorption of said adsorption means only when the total air intake throughput to said engine exceeds a predetermined minimum amount substantially greater than that which occurs during engine idle, whereby stored fuel vapors from said adsorption means are combusted in said engine under optimum conditions of engine operation to minimize the amount of unburned fuel in the engine exhaust.

4,085,722

DISTRIBUTOR TYPE FUEL PUMP

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 1, 1976, Ser. No. 728,471
Int. Cl.[2] F02M *49/00;* **F04B** *19/22*
U.S. Cl. 123—139 AL **8 Claims**

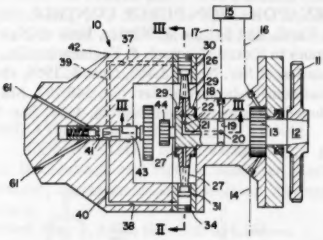
1. A distributor type fluid pump comprising:

a housing having a plurality of passages adapted for connection to a plurality of cylinders;

a first bore in said housing defining a first, longitudinal axis;

a rotatable shaft received in said first bore;

a second bore in said housing defining a second, longitudinal axis;
a rotor mounted in said second bore for both reciprocating and rotating movement;
pump means connected to said shaft for providing fluid under pressure, said pump means comprising:
an eccentric on said rotatable shaft,
a pair of oppositely directed pump rods each having an end rotatably mounted on said eccentric,
a piston mounted on a free end of each said rod,
each said piston being slidably received in a bore defining a chamber with said housing,
a passage in each said pump rod intercommunicating the piston end with the end rotatably mounted on the eccentric,



an arcuate slot in said eccentric,
passage means in said shaft intercommunicating said slot with a source of fluid whereby rotation of said shaft causes fluid to be alternately communicated to each said chamber so as to supply said rotor with fluid;
first passage means in said housing communicating each said chamber with said rotor so as to provide pressure fluid thereto;
scroll means on said rotor for directing and metering fluid alternately to each one of said plurality of passages depending upon the rotational position of said rotor; and,
timing means interconnecting said rotatable shaft with said rotor for changing the rotative position of said shaft with respect to said rotor whereby timing of said pump may be adjusted.

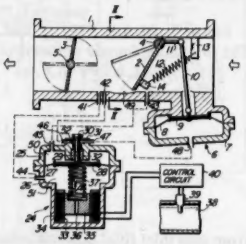
4,085,723

FUEL CONTROL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Eizi Tanaka, Anjo; Michihiro Ohashi, Handa, and Hiroshi Mochizuki, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 14, 1976, Ser. No. 695,555
Claims priority, application Japan, Jun. 25, 1975, 50-79675
Int. Cl.[2] F02M *69/00*
U.S. Cl. 123—139 AW **6 Claims**

1. A fuel control system for an internal combustion engine comprising:
an air intake pipe through which air is introduced into an engine;
a throttle valve pivotally disposed in said intake pipe for controlling the flow rate of intake air flowing therethrough;
an unbalanced sensing vane pivotally disposed in said intake pipe upstream of said throttle valve;
pressure responsive actuating means having a pressure chamber, a movable member operable in response to a pressure introduced into said pressure chamber, and connecting means for operatively interconnecting said movable member with said sensing vane, whereby said actuating means actuates said sensing vane to open and close in response to the pressure introduced into said pressure chamber;
conduit means communicating said pressure chamber with said intake pipe between said sensing vane and said throttle valve, to thereby introduce a pressure produced in said intake pipe between said sensing vane and said throttle valve into said pressure chamber;
pressure difference responsive means for controlling the introduction of the pressure into said pressure chamber in response to a pressure difference between a pressure in said intake pipe upstream of said sensing vane and a pressure in said intake pipe downstream of said sensing vane so as to maintain the pressure difference across said sensing vane at a constant value, whereby said sensing vane is pivoted in proportion to the flow rate of the intake air;



fuel delivering means operatively coupled to said sensing vane for delivering fuel in response to the pivotal displacement of said sensing vane;
an air-fuel ratio sensor mounted in an exhaust pipe of the engine for sensing the air-fuel ratio based on the composition of the exhaust gas and generating an output signal when the detected air-fuel ratio is deviated from a predetermined value; and
means operatively coupled to said air-fuel ratio sensor and said pressure difference responsive means for changing the constant value of the pressure difference across said sensing vane to another constant value in response to said output signal.

4,085,724

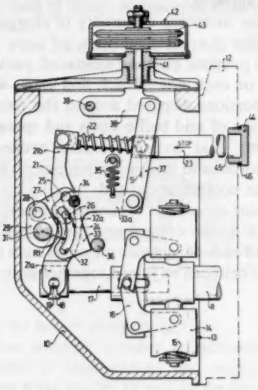
FUEL REGULATOR FOR INTERNAL COMBUSTION ENGINES WITH INJECTION SYSTEM

Ilija Djordjevic, Stuttgart; Hans-Jürgen Jaenke, Ditzingen; Ernst Ritter, Stuttgart, and Heinrich Staudt, Markgroningen-Talhausen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Jun. 9, 1976, Ser. No. 694,213
Claims priority, application Germany, Jun. 12, 1975, 2526148
Int. Cl.[2] F02D *1/14*
U.S. Cl. 123—140 MC **14 Claims**

1. In a regulator for the fuel supply system of a fuel-injected internal combustion engine, said regulator including a housing containing: an rpm-dependent governor member; part of a fuel quantity control member of the fuel supply system; an intermediate lever, with the governor member being linked by the intermediate lever to the fuel quantity control member; an actuating member; and a pin, with said intermediate lever being pivoted on the pin and attached thereby to the actuating member, and further including a correcting device, mounted to the housing and coupled to said pin to change the position thereof independently of said actuating member to thereby also change the position of said fuel quantity control member, the improvement comprising:
said intermediate lever being provided with a slotted track within which said pin moves;
a bell crank element, pivotably connected to and forming part of said actuating member and fixedly carrying said pin and a further pin; and
a cam-plate, pivotably attached to said housing and provided with a cam-track in which said further pin moves, and

pivotably connected to said correcting device, whereby the pivotal axis of said cam-plate is disposed in the housing such that, in an idling position of said actuating member a



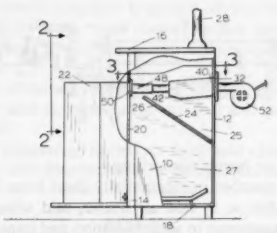
lesser or greater correction of the position of the fuel quantity control member is controllable by said correcting device than in a full-load position of said actuating member.

4,085,725

FORCED AIR ROOM HEATER FOR FRANKLIN STOVE

Michael V. Mesenbrink, 10902 SW. 63rd, Portland, Oreg. 97219

Filed Oct. 7, 1976, Ser. No. 730,339
Int. Cl.² F24H *3/08*
U.S. Cl. 126—110 B **5 Claims**



1. A forced air heater for installation into a stove of the type having a firebox enclosed by side walls, a back wall, a top, a bottom, and a front wall, having an opening in the front wall with doors piviotably attached thereto arranged for closing the opening, having flue openings in both the top and in the back wall, containing spaced bores in said back wall arranged around the flue opening located therein for mounting a cover plate, and having a baffle diagionally dividing the firebox into a lower burning section and an upper heating section, the heater comprising:

(a) a mounting plate configured for covering the flue opening in the back wall of the stove, said mounting plate having a central opening passing there through in alignment with the flue opening;

(b) the mounting plate having bores located therein in a manner for aligning with the bores in the stove backwall;

(c) bolts configured for being received in the bores in the mounting plate and in the backwall for fastening the mounting plate to the stove;

(d) a rectangular plenum chamber configured for placement in the upper heating section of the stove firebox;

(f) the plenum having a first wall defining an opening configured to be in alignment with the central opening in the mounting plate;

(g) the mounting plate having holes located in a spaced array around said central opening;

(h) studs mounted on said first wall of the plenum chamber in a manner for communicating with the holes in the mounting plate, and nuts configured for engagement with the studs, securing the plenum chamber to the mounting plate;

(i) a fan and fan mounting means interconnecting the fan to the mounting plate in alignment with the central opening located therein; and

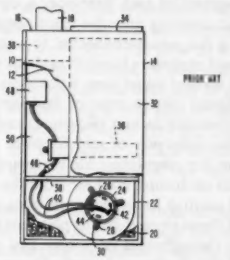
(j) outlet means connected to the plenum chamber and opening outside the stove.

4,085,726

FORCED AIR FURNACE MOTOR LEAD WIRE PROTECTION

Donald G. Van Boven, Elyria; John C. Burdett, Lima, and Richard J. Vales, Elyria, all of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 20, 1976, Ser. No. 752,720
Int. Cl.² F24F *3/06*
U.S. Cl. 126—110 R **4 Claims**



1. In a forced air furnace including a cabinet having a double-inlet centrifugal blower housing a fan wheel and a direct drive motor resiliently mounted internally thereof, the blower housing being mounted on one side of a slidable support plate, and the motor having non-metallically shielded electrical leads exiting from one end of the motor and blower housing inlet and extending through the support plate to a location in the cabinet on the other side of the support plate, a conversion arrangement for shielding the leads and connections in the space on the blower side of the support plate, comprising:

an electrical junction box mounted on the same side of said blower support plate as said blower and with a side of said junction box in generally planar alignment with the one inlet side of said blower from which the motor leads exit;

a generally channel-shaped raceway having a length to extend from said junction box to the location on said motor end where said leads exit;

means facing the open side of said channel and connected thereto at selected locations to hold said leads within the channel of the raceway after the leads are threaded along the channel;

means securing one end of said raceway to said side of said junction box;

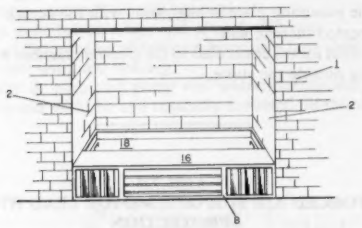
means securing said raceway at an intermediate location along its length to said one inlet side of said blower housing;

the end of said raceway facing said motor end being spaced away from said motor end and being unconnected thereto so that the resilient character of the mounting of the motor within said housing is unimpaired by said shielding raceway.

4,085,727
AIR CIRCULATING HEATER FOR FIREPLACES

Sherman R. Gillpatrick, 402 Chambers #54, El Cajon, Calif. 92020

Filed Jun. 30, 1976, Ser. No. 701,232
Int. Cl.[2] F24B 7/02
U.S. Cl. 126—121 7 Claims

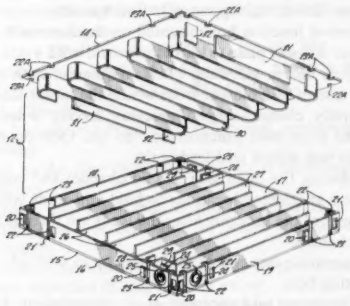


1. An air circulating heater for a fireplace comprising a generally rectangular metal enclosure having a floor, and side and rear walls, and a front panel, said panel having central inlet louvered and end air discharge louvered areas, said enclosure being relatively shallow in height for positioning on the floor and in the bottom of said fireplace, a cover hinged to said enclosure and covering only the front portion thereof, electrical circulating fan means connected to a source of power and arranged in said enclosure beneath said cover and to the rear of said central louvered panel area, a flat metal fireplate arranged on said enclosure to the rear of said cover for heating air flowing therebeneath in said enclosure, and baffle plate means formed on the underside of said fireplate and extending into said enclosure for circulating air rearwardly and thence forwardly of said enclosure, cold air from the room being drawn through said central louvered panel area into said enclosure and directed through said baffle plate means for heating and recirculating through said enclosure and return to the room through said end discharge louvered areas.

4,085,728
SOLAR ENERGY HEATER

Sigfrid A. Tomchak, 16896 Lolo Cir., Fountain Valley, Calif. 92708

Filed Aug. 16, 1976, Ser. No. 714,691
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 7 Claims

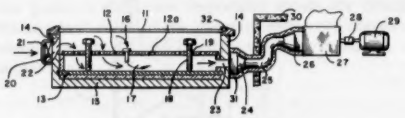


1. A modular energy cell comprising
first and second surfaces,
a plurality of side members connected to peripheral edges of said first and second surfaces to form a cavity therein,
at least a first baffle wall attached to one of said side members and extending toward the opposite side member,
at least a second baffle wall attached to said opposite side member and extending toward said one side member,
a continuous rib member attached to at least one of said first and second surfaces,
said rib member including a plurality of elongated portions and a plurality of arcuate portions,
said elongated portions disposed in spaced, parallel relationship to and on each side of each said baffle wall,
said arcuate portions disposed around the free end of the respective one of said baffle walls and spaced from said side members, said arcuate portions connected to said elongated portions to form a continuous rib member having a sinuous configuration, and
alignment means on each of said side members,
said alignment means comprises a projection from and a depression in each of said side members such that adjacent solar energy cells can be joined together in an interlocking array.

4,085,729
SOLAR AIR HEATER

Roger N. Schmidt, Plymouth, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 10, 1976, Ser. No. 740,639
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 7 Claims

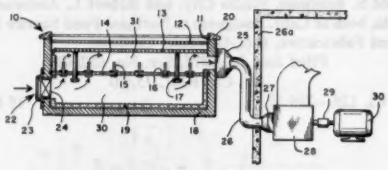


1. A solar air heater comprising:
a window member in substantially sheet form for admitting solar radiation to said air heater, said window member being transparent to solar radiation and impervious to air;
an absorber member in substantially sheet form disposed in spaced relation to said window member, said absorber member being highly absorbent to solar energy, impervious to air and disposed to receive solar energy transmitted by said window member;
an air distribution member in substantially sheet form interposed between said absorber member and said window member in spaced relation thereto said distribution member being transparent to solar radiation and having a plurality of openings therein;
closure means adapted to receive said window, absorber and air distribution members in spaced relation forming chambers therebetween, said chambers including a first chamber formed between said window member and said air distribution member and a second chamber formed between said air distribution member and said solar energy absorber member;
and wherein said plurality of openings in said air distribution member are predetermined in size and pattern such that air flowing from said first chamber to said second chamber impinges on the absorbing surface of said absorber member;
means for admitting unheated air to said first chamber; and
means for exhausting heated air from said second chamber.

4,085,730
SOLAR AIR HEATER

Asbjorn M. Severson, Minneapolis, and Richard L. Sampson, Excelsior, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 10, 1976, Ser. No. 740,640
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—270 11 Claims



1. A solar air heater comprising:

at least one window member in substantially sheet form transparent to solar energy and impervious to air for admitting solar energy to said air heater;

an absorber member in substantially sheet form beyond said window in spaced relation, thereto said absorber member being highly absorbent to solar energy, heat conductive, impervious to air and disposed to directly receive the solar energy transmitted by said window member;

an air distribution member in substantially sheet form beyond said absorber member and disposed in spaced relation thereto said distribution member having a plurality of openings therein said plurality of openings being of a predetermined size and pattern such that air flowing therethrough toward said absorber member impinges on said absorber member;

closure means adapted to receive said window, absorber and air distribution members in spaced relation forming chambers therebetween, said closure means having a lower surface forming a chamber with said air distribution member;

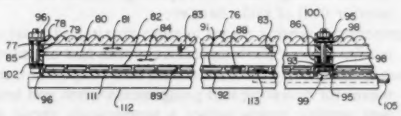
means for admitting unheated air to said chamber formed between said air distribution member and said lower surface; and

means for exhausting heated air from said chamber formed between said absorber and air distribution members.

4,085,731
SOLAR ENERGY CONVERSION SYSTEM

Richard Lloyd Weir, 75 Sinclair Ave., Dayton, Ohio 45405

Filed Mar. 10, 1976, Ser. No. 665,504
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 3 Claims



1. A solar energy conversion system comprising

a top panel having an upper surface of solid half-round cylindrical lens sections of rod-like configuration, said sections extending continuously from one end of said panel to the other;

a base plate spaced below said top panel;

means forming a sealed air chamber between said top panel and said base plate;

means forming a black-faced fluid circulating chamber below said base plate; and

means forming an air circulating chamber between said base plate and said fluid circulating chamber and extending substantially over the entire black face of the fluid circulating chamber for passing air there-through.

4,085,732
METHOD AND APPARATUS FOR HEATING A LIQUID USING SOLAR ENERGY

Ervin E. Hysom, 2307 Hyacinth, Wichita, Kans. 67204

Filed Jun. 7, 1976, Ser. No. 693,349
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 6 Claims

1. An apparatus for heating a liquid using solar energy, the apparatus comprising:

an absorber plate with horizontal corregations and having a frontside and a backside, the frontside of said plate positioned at an angle to face the sun, the corregations of said plate positioned transverse to the flow of a liquid as the liquid is fed across the backside of said plate and downwardly along the length of the backside of said plate;

a supply line for distributing a thin film of liquid onto the backside of said plate, the liquid flowing downwardly by gravity across the corregated surface of the backside of said plate and along the length of the backside of said plate; and

a drain line disposed adjacent the bottom of the backside of said plate, said drain line receiving the heated liquid therein and discharging the liquid from the apparatus;

the top portion of said plate curved upwardly and below a portion of said supply line, said supply line disposed above the curved top portion of said plate and adjacent a vertical plane tangent to the backside of said plate at a position where the top portion of said plate starts to curve upwardly.

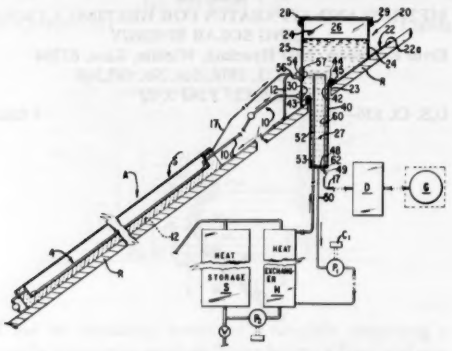
4,085,733
ROOF-MOUNTABLE CHAMBER AND CONDUIT DEVICE FOR SOLAR HEAT COLLECTING APPARATUS

Vernon O. Bowles, 342 Third Ave. N., Naples, Fla. 33940

Continuation-in-part of Ser. No. 676,156, Apr. 12, 1976. This application Aug. 30, 1976, Ser. No. 718,565
Int. Cl.[2] F24J 3/02
U.S. Cl. 126—271 5 Claims

1. A roof-mountable combined chamber and conduit device for an apparatus for collecting solar heat, which apparatus includes at least one substantially planar radiation receptor mounted on a sloped support structure such as a roof and adapted to confine liquid in a thin layer across a path of solar radiation, conduit means for conducting liquid heated in said receptor in a flow circuit from the receptor to a heat exchange zone beneath said support structure and thence back into the receptor, and a chamber for holding liquid in communication with and at an elevation higher than the liquid in said receptor so as to permit expansion and contraction of the liquid while keeping said receptor and said circuit filled with the liquid under a limited hydrostatic pressure, said device comprising a liquid impermeable base member sealable upon said support structure about an opening therethrough, a side wall upstanding from said base member and forming said chamber, a tubular extension depending from said base member and forming a wall portion of said chamber extending through said opening, an inlet through said side wall for passing liquid heated in said

receptor into said chamber from a part of said conduit means, and an outlet from the lower end of said extension for downflow of said heated liquid into a part of said conduit means leading to said heat exchange zone, whereby said device will



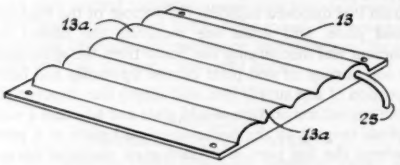
serve for initial filling of said receptor and said flow circuit with liquid, for venting air and vapors therefrom and, during operation, as said expansion chamber and as a roof-traversing part of said conduit means.

4,085,734

SOLAR HEATERS

Norman S. Gibbs, Rte. 1, Box 176, Loveland, Colo. 80537

Filed Sep. 7, 1976, Ser. No. 721,097
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **3 Claims**



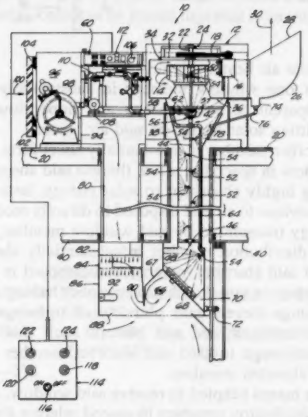
1. A solar heat collector unit comprising a metal frame, a thick plastic heat insulative material piece formed integral with the frame, a liquid seal sheet means completely covering a side of the insulative material, a single likeshaped metal heat absorber plate means completely covering said seal sheet means and having a plurality of convex formed channels therein with the channels formed on a side thereof opposite from the seal sheet means side and adapted to act as liquid ducts and connected with each other by a convex liquid distribution duct, a single transparent dome member means completely sealingly covering said heat absorber plate means in sealed spaced air relationship thereover, said frame and heat absorber plate means and seal sheet means and dome each having collar means adapted for adjacent abutment so as to be clampingly held thereby together peripherally, a ring washer between the liquid sheet seal means and the heat absorber plate means, a plurality of fastening means extending through the frame and seal sheet means and absorber plate means and dome member and adapted for compressing and holding the collar means of each together in sealed relationship, liquid ducts communicating the interior of said channels with a reservoir, an air tube sealed duct communicating the underside of the transparent member with an air suction pump for providing an air tight connection with the space between the underside of the dome member and the adjacent exterior of said channels with an air suction pump, an operable air suction pump connected with said air tube duct, whereby upon operation the air suction pump a vacuum is created thereby in the scope between the transparent member and the channels of the heat absorber plate means when the fastening means is so sealingly tightened to hold the frame and seal sheet means and metal absorber plate means and dome member sealingly together in tight seal relationship.

4,085,735

AIR VENTILATION AND WASHING SYSTEM

Arnold S. Kaufman, Studio City, and Robert L. Anderson, Reseda, both of Calif., assignors to National Food Service Equipment Fabricators, Inc., Glendale, Calif.

Filed Jan. 26, 1976, Ser. No. 652,484
Int. Cl.² F24C *15/20*
U.S. Cl. 126—299 E **15 Claims**



1. In a ventilation system including an interior wall defining a chamber through which contaminated hot air is adapted to pass, an improved cleaning and fire extinguishing system for cleaning contaminants from said interior wall and extinguishing any fire or incipient fire in the proximity of said chamber, comprising:

a fluid dispersing member in said chamber; said fluid dispersing member having outlet openings through which cleaning fluid may be dispersed onto said interior wall of said chamber to wash away contaminants thereon;

pump means for delivering cleaning fluid through said fluid dispersing member and onto said interior wall of said chamber;

means for selectively operating said pump means to selectively deliver cleaning fluid to said fluid dispersing member and through said outlet openings thereof and onto said interior wall of said chamber;

temperature sensing means in close proximity to said chamber for sensing the temperature within said chamber; and

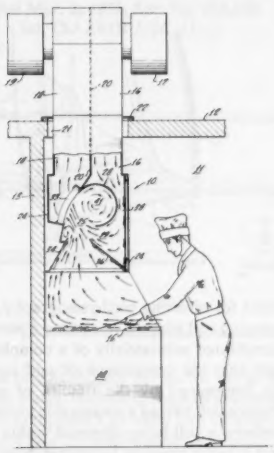
means operatively associated with said temperature sensing means for operating said pump means when said temperature sensing means senses a temperature above a first predetermined level in the vicinity of said chamber to deliver fluid to said fluid dispersing means and into said chamber, and further including a bypass line passing around said pump means for delivering fluid from a source of fluid to said fluid dispersing member and into said chamber; and further including a normally closed valve means in said bypass line; and further including means connected to said valve means for opening said valve means when the temperature in the vicinity of said chamber exceeds a second predetermined level above said first predetermined level for opening said valve means to deliver fluid from a source of fluid to said fluid dispersing member and into said chamber.

4,085,736

GREASE-HOOD APPARATUS

Irvin R. Kuechler, San Bernardino, Calif., assignor to Vent-Cair, Inc., San Bernardino, Calif.

Filed Oct. 1, 1975, Ser. No. 618,831
Int. Cl.[2] F24C 15/20
U.S. Cl. 126—299 D 16 Claims



1. A grease-hood apparatus of the vortex type, which comprises:

(a) grease-filter means adapted to have passed therethrough grease and fumes from the cooking appliance with which the grease-hood apparatus is associated, the upstream face of said grease-filter means comprising surface means which is curved,

(b) vortex-liner means mounted adjacent said filter means and adapted to receive air and fumes deflected off said curved upstream face of said filter means and then to curve said air and fumes in a vortex,

(c) means to pass air and fumes from the cooking appliance into the vicinity of said filter means,

(d) means to draw air and fumes through said filter means, and

(e) means to supply make-up air to said grease hood and to effect vortical flow in such vortex-liner means of such make-up air and of air and fumes from said cooking appliance, said vortical flow resulting not only from the shape of said vortex-liner means but also of said shape of said upstream face of said grease-filter means.

4,085,737

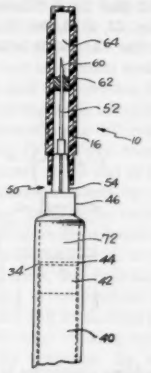
DEVICE AND TECHNIQUE FOR MINIMIZING RISK OF CONTAMINATION BY BLOOD SAMPLE

Richard A. Bordow, 6114 Terryhill Dr., La Jolla, Calif. 92037

Filed Sep. 3, 1976, Ser. No. 720,624
Int. Cl.[2] A61B 19/00
U.S. Cl. 128—2 F 17 Claims

1. In combination with a blood sampling syringe having a needle with an open end, apparatus which comprises means for covering said open end of said needle and means for drawing a small amount of fluid from said syringe into said covering means through said open end.

12. A technique for reducing the risk of contamination by sampled blood, which comprises the steps of taking a blood sample by drawing blood from a patient through an open-



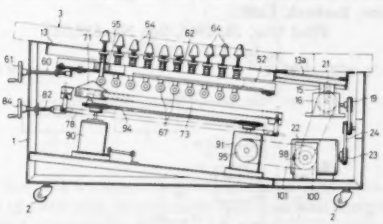
ended needle into a syringe, and enclosing the open end of the needle of the syringe in an evacuated chamber.

4,085,738

AUTOMATIC DISEASE-DETECTING TREATMENT APPARATUS FOR THE SPINE

Katsuji Kodera, 35-12, Wada 1-chome, Suginami, Tokyo, Japan

Filed Mar. 4, 1977, Ser. No. 774,653
Claims priority, application Japan, Jul. 23, 1976, 51-087176
Int. Cl.[2] A61B 5/00; A61F 5/00
U.S. Cl. 128—2 N 13 Claims



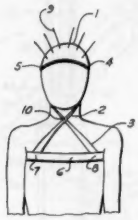
1. An automatic disease-detecting treatment apparatus of the spine comprising a machine base, a mobile bed which moves in the longitudinal direction on said machine base, an adjustable pillow stand, a head-rest located on said pillow stand, which pillow stand and head-rest are located at one end of said mobile bed, two adjustable cross members mounted at intervals parallel to the longitudinal movement of said mobile bed, a plurality of cylindrical pressure members of adjustable mounting height which form covered pressure members at the tips, an angular cam which engages itself with said pressure members at the lower surface of said pressure members and which moves longitudinally in the direction of the movement of said bed, a flexible member fixed at one end to said head-rest of said mobile bed and at the other to said machine base, a plurality of indicator plates on said flexible member arranged in accordance with the positions of human organs, showing each of these organs, and a pointer provided at said angular cam, which moves longitudinally at the back of the said flexible member.

4,085,739

ELECTROENCEPHALOGRAPH CAP AND ELECTRODE HARNESS

Marvin W. Sams, P.O. Box 3515, Toledo, Ohio 43608

Filed Nov. 22, 1976, Ser. No. 743,571
Int. Cl.[2] A61B 5/04
U.S. Cl. 128—2.1 B 5 Claims



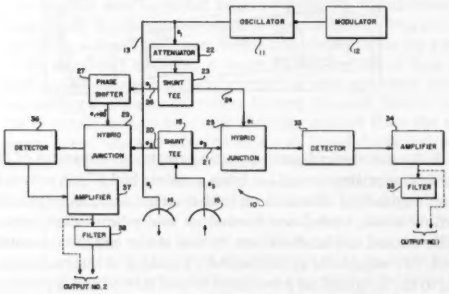
1. A harness for holding electrodes in contact with selected points on a patient's head while obtaining electroencephelographic data, said harness comprising, in combination, a cap of flexible material and size to loosely fit a patient's head, a plurality of electrodes mounted at selected points in said cap and arranged to contact the patient's scalp, a harness band of sufficient length to encircle the patient's body below the armpits, and a pair of elastic straps attached to and extending from lateral portions of the cap in criss-cross manner to said harness band, whereby the cap is held firmly in place without inducing muscular reaction or inhibiting free movement of the patient's head.

4,085,740

METHOD FOR MEASURING PHYSIOLOGICAL PARAMETER

William P. Allen, Jr., Atlanta, Ga., assignor to Lockheed Corporation, Burbank, Calif.

Filed Mar. 28, 1966, Ser. No. 538,023
Int. Cl.[2] A61B 5/02
U.S. Cl. 128—2.05 R 10 Claims



1. A method of measuring a body function parameter of an organism, comprising the steps of:

directing a beam of phased energy toward the body of the organism at a region thereon which undergoes physical movement in response to a variation in the body function parameter being measured; and

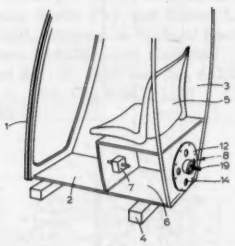
receiving phased energy reflected from said region of the body to produce a received signal corresponding to said physical movement of the body region and thus corresponding to said variations in the body function parameter being measured.

4,085,741

APPARATUS FOR EFFECTING PLETHYSMOGRAPHY

Gerrit Jacob Rotgans, Hilversum, Netherlands, assignor to Gould Godart B.V., Bilthoven, Netherlands

Filed Aug. 11, 1976, Ser. No. 713,606
Int. Cl.[2] A61B 5/08
U.S. Cl. 128—2.08 4 Claims



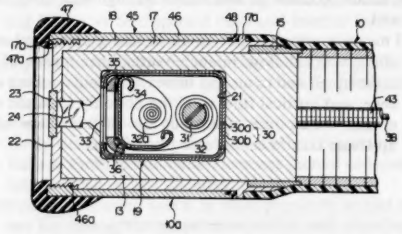
1. Apparatus for effecting plethysmography, comprising an airtight measuring cell adapted to enclose a person to be examined, and constituted substantially of a compliant transparent material such that the compliance of said measuring cell is substantially determined by the rigidity of said material, a smaller reference cell having a measurable volume and compliance, said reference cell being disposed within said measuring cell such that exterior pressure variations cause equal pressure variations in both cells, means for measuring the difference between the pressures in said two cells, and means for adjusting the ratio of the volume to the compliance of said reference cell, so that this ratio may be made exactly equal to the corresponding ratio for said measuring cell.

4,085,742

ENDOSCOPE EQUIPPED WITH A FILM CASSETTE

Takeshi Okada, 13-45,, Terada-machi, Hachioji-shi Tokyo, Japan

Filed Jul. 23, 1976, Ser. No. 708,032
Claims priority, application Japan, Jul. 28, 1975, 50-91656
Int. Cl.[2] A61B 1/00
U.S. Cl. 128—4 3 Claims



1. An endoscope equipped with a film cassette comprising:

a sheath with a detachable film cassette incorporated in the forward end thereof;

a control section connected to the base end of the sheath;

a film cassette access opening formed in the outer periphery of the forward section of the sheath;

outer cover means comprising a hollow member having a shape corresponding to that of the outer periphery of the forward section of the sheath and detachably fitted thereon to permit the film cassette access opening to be closed;

and a hood member made of an elastic material and integrally secured to at least the outer periphery of the forward end portion of the hollow member to protect the front end surface of the forward section of the sheath and

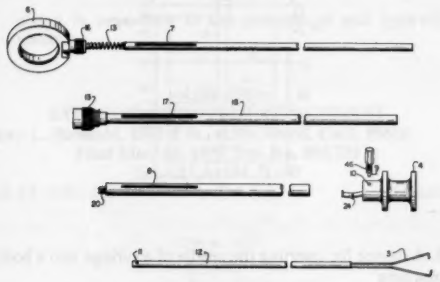
to impart no injury to the inner cavity of a human being during the insertion of the sheath into said inner cavity.

4,085,743

MULTIPLE OCCLUSION RING APPLICATOR AND METHOD

In Bae Yoon, 2213 Forest Ridge Rd., Timonium, Md. 21093

Filed Mar. 2, 1976, Ser. No. 663,103
Int. Cl.[2] A61B *1/06, 17/12*
U.S. Cl. 128—6 **46 Claims**



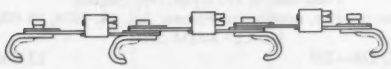
26. A multiple ring applicator device for use in sequentially applying multiple elastic occluding rings to anatomical tubular structures which comprises a cylinder like element, the proximal end portion of said cylinder-like element being adapted to receive an elastic occluding ring, forceps means slidably associated with said cylinder-like element and operative to grasp an anatomical tubular structure and draw it inside said cylinder-like element to form a bend therein, a first ring pushing means, the proximal end portion thereof being adapted to receive an elastic occluding ring, said first ring pushing means being movably and operatively associated with said cylinder-like element for displacing an elastic occluding ring from said cylinder-like element to a position around said bend, thereby forming a closed loop in said anatomical tubular structure, a second ring-pushing means movably and operatively associated with said first ring pushing means for displacing an elastic occluding ring therefrom to a position on the proximal end portion of the cylinder-like element to reload the device and operating slide means being in selective engaging relationship with the forceps means, the cylinder-like element and the first and second ring pushing means for effecting relative movement therebetween, thereby forming said closed loop in the anatomical tubular structure, reloading its device and discharging the occluded anatomical tubular structure from the device.

4,085,744

SPINAL COLUMN PROSTHESES ORTHOSES

David Warren Lewis, Rte. 2, Box 198, Charlottesville, Va., and Robert K. Greenlaw, 708 George St., Sydney, Canada

Filed Jan. 31, 1977, Ser. No. 764,049
Int. Cl.[2] A61F *5/00*
U.S. Cl. 128—69 **2 Claims**



1. Spinal column prostheses/orthoses which will correct problems involving scoliosis, kyphosis, spinal instability from a variety of causes, and rotational and mal-alignments by exerting a combination of forces on one or more pairs of vertebrae, comprising:

A. a first elongated member having a longitudinal axis and a second elongated member overlapping said first member and having a longitudinal axis which is parallel to the longitudinal axis of said first member;

B. adjustment means on one end of both said first and second members for controlling the longitudinal length of the combination of the first and second elongated members;

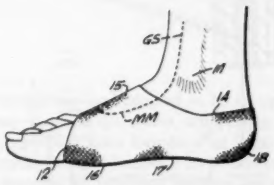
C. a first hook means positioned at the end of said first member opposite said adjustment means, said hook means being attached to said first member through joint means by which said hook means is inserted into a hole in said first member followed by a 90° rotation of said hook means with respect to said first member, and a second hook means positioned at the end of said second member opposite said adjustment means by second joint means identical to said first joint means, each of said joint means including means for allowing rotation of each of said hook means about an axis perpendicular to the longitudinal axis of each of said members, the combination of said first and second hook means in conjunction with said first and second members and said adjustment means taken in combination to provide, upon hooking onto two chosen vertebrae, tension in the vertebrae, the amount of which is controlled by the surgeon by said adjustment means.

4,085,745

ELASTIC SUPPORT FOR THE VEINS OF THE FOOT

Santiago S. Alenares, 3038 SW. 8th St., Apt. B202, Miami, Fla. 33135

Filed Feb. 14, 1977, Ser. No. 768,598
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—165 **4 Claims**



1. A foot sock for supporting the superficial veins of the foot formed of a two-way stretch elastic fabric material comprising a modified tubular body having a front toe opening and a top ankle opening, each with a finished border, said tubular body having a relatively straight configuration extending between said front and top openings along an upper side thereof defining a dorsum portion and an irregular configuration along the bottom side defining a metatarsal enlargement, an arch constriction and a heel enlargement, when in operative position on the foot said toe opening positioning the border thereof along the base of the toes, said top ankle opening being located to position the border thereof to extend above the heel at the lower part of the Achilles tendon and forwardly in a substantially horizontal direction along both sides of the foot passing just below the lateral malleolus and on the opposite side at the same level spaced below the medial malleolus and to curve upwardly across the dorsum just below the angle of the ankle, said dorsum portion cooperating with said metatarsal enlargement, said arch constriction and said heel enlargement to exert a uniform support pressure of a predetermined magnitude on the superficial veins of the metatarsal and tarsal areas of the foot including the medial marginal and lateral marginal veins.

4,085,746

ANKLE WRAP

Ignatius F. Castiglia, New York, N.Y., assignor to Lenox Hill Brace Shop, Inc., New York, N.Y.

Filed Sep. 20, 1976, Ser. No. 724,495
Int. Cl.[2] A61F 13/06
U.S. Cl. 128—166 12 Claims

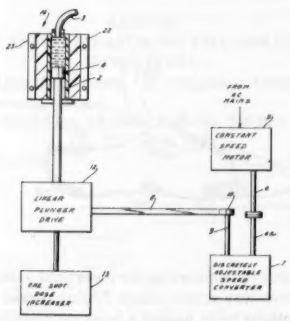
1. An ankle wrap comprising in combination an elongated panel, first fastening means secured to a first elongated end portion of said panel, and second fastening means carried by said panel are positioned spaced apart from said first fastening means when said elongated portion of said panel between said first and second fastening means is wrapped around the arch portion of a foot said portion of said panel between said first and second fastening means being inelastic, and further fastening means disposed at the other elongated end portion of said elastic panel for releasably securably fastening said panel about said ankle and arch portion after said panel has been alternately wrapped about said ankle and arch portion in a predetermined manner said portion of said elongated panel between said second fastening means and third fastening means being elastic.

4,085,747

INFUSION PUMPS AND DOSAGE CONTROL MEANS THEREFOR

Arnold St. Jacques Lee, Red Bank, N.J., assignor to Milstein Medical Research Foundation, Inc., New York, N.Y.

Filed Dec. 13, 1976, Ser. No. 750,189
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—214 F 18 Claims



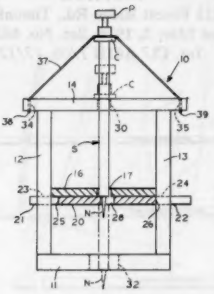
1. In an infusion pump for delivering a metered amount of a drug, cylindrical barrel means adapted to receive a quantity of the drug, the barrel means having an open rear end for receiving the front end of a plunger and further having an opening in a forward wall thereof through which the drug can be ejected upon a forward movement of the plunger in the barrel means, the barrel means comprising, in combination, a thin-walled, relatively compliant cylindrical syringe adapted to receive the plunger and having a nominal outer diameter, a cylindrical clamping member axially coextensive with and radially positionable coaxially over the syringe, the inner diameter of the clamping member being adjustable inwardly to an inner limit representing a fixed standard inner diameter smaller than the nominal outer diameter of the syringe, and means for releasably applying an inwardly directed radial clamping force to the clamping member to deform the wall of the syringe into conformance with the standard inner diameter of the clamping member, whereby the syringe forms an intimately adhering liner for the clamping member.

4,085,748

SYRINGE INJECTOR

Emanual F. Boyer, 4826 Oak Orchard Rd., Albion, N.Y. 14411

Filed Nov. 1, 1976, Ser. No. 737,275
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—215 6 Claims



1. A device for inserting the needle of a syringe into a body, comprising

a first pair of spaced members having therein a pair of registering openings,

two additional members mounted adjacent each other in the space between said first pair of members,

one of said additional members having therein an opening registering with the pair of openings in said first pair of members,

means mounting the other of said additional members for movement selectively between a cocked position in which an opening herein is laterally offset slightly from the opening in said one additional member, and a fired position in which the opening therein registers with the opening in said one additional member, and

resilient means mounted on one of said first pair of members and operable, when the other of said additional members is in its cocked position, releasably to support a syringe needledown in the opening in said one of said first pair of members with the lower end of said syringe urged resiliently against a marginal portion of said other additional member adjacent said opening therein,

said marginal portion of said other additional member being movable from beneath said lower end of the syringe upon movement of said other additional member to its fired position, whereupon the syringe is urged suddenly downwardly through the now-registering openings in said members to inject the needle on the lower end thereof through the opening in the other of said first pair of members and into any portion of a body registering therewith.

4,085,749

METHOD AND APPARATUS FOR CONTROLLING THE MOVEMENT OF FLUID TO AND FROM A SYRINGE

Edmond Chambron, Paris, France, assignor to Compagnie Generale de Radiologie, Paris, France

Filed Jan. 4, 1977, Ser. No. 756,665
Claims priority, application France, Jan. 14, 1976, 76 00887
Int. Cl.[2] A61M 5/00
U.S. Cl. 128—215 12 Claims

1. A method for aspirating and expelling fluid to and from a syringe comprising the steps of:

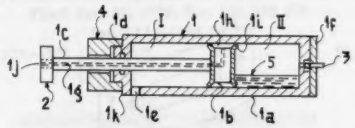
providing an actuator having a cylinder-piston assembly and defining first and second chambers in said cylinder;

admitting a measured quantity of pressurized hydraulic medium to said first chamber in said actuator;

providing a syringe and coupling the motions of the piston of said syringe to the motions of the piston of said actuator;

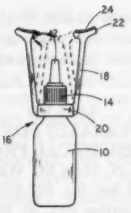
admitting a quantity of liquifiable gas to said second cham-

ber of said actuator; whereby the saturated vapor pressure of said liquifiable gas exerts a counter-pressure on said



piston in opposition to the pressure of said hydraulic medium.

4,085,750
EYEDROPPER BOTTLE ATTACHMENT
Barry L. Bosshold, 1005 J St., #366, Davis, Calif. 95616
Filed Mar. 10, 1975, Ser. No. 556,739
Int. Cl.² A61M *31/00*
U.S. Cl. 128—233 **9 Claims**



8. An attachment for a lightweight squeeze type eyedropper bottle comprising;

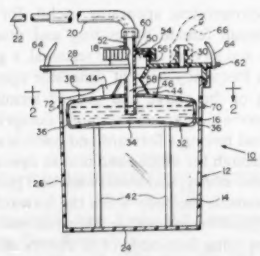
a flexible cup;

pads on opposite rims of said cup being spaced to engage against the outer surfaces of the eyelids for frictional engagement thereof;

means for securing said cup near the top of said eyedropper bottle to extend upwardly therefrom;

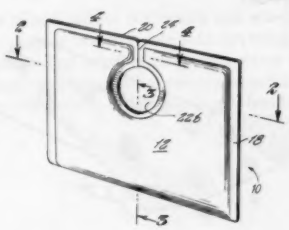
the flexibility of said cup enabling said opposite rims to be grasped and forced closer together before being placed against the eyelids but asserting flexural strength around the cup to restore it to normal configuration and force the eyelids apart.

4,085,751
DRAINAGE APPARATUS
Larry H. Dodge, St. Charles, Mo., assignor to Sherwood Medical Industries Inc., St. Louis, Mo.
Filed Oct. 2, 1975, Ser. No. 619,109
Int. Cl.² G01F *19/00*; A61B *5/00*
U.S. Cl. 128—275 **25 Claims**



1. A fluid drainage device for collecting drainage fluid from a cavity of a patient comprising a relatively rigid container having a fluid drainage collection chamber therein, a liquid seal chamber therein having a bottom wall, side walls, an upper wall extending generally radially inwardly from said side walls and spaced above said bottom wall, and an opening in said upper wall connecting said collection and seal chambers in fluid communication for the passage of fluid therebetween, gas outlet means for removing gas from the interior of said container, said seal chamber being disposed above said collection chamber with its vertical axis substantially coincident with the vertical axis of said collection chamber and adapted to receive and capable of holding an initial quantity of liquid therein, fluid passage means extending into said container in fluid communication with said collection and seal chambers, and means for connecting a tube to said passage means for connecting said passage means in fluid communication with a cavity of a patient to be drained, said passage means extending into said seal chamber such that all gas flowing from the cavity to said gas outlet means flows into said seal chamber and through the liquid therein before reaching said gas outlet means and liquid flowing from the cavity to said collection chamber flows over the upper side of said upper wall before flowing into said collection chamber during operation of the device.

4,085,752
COLOSTOMY BAG PAD
James Canale, c/o General Delivery, Collins Ct., Eastport, N.Y. 11941
Filed May 7, 1976, Ser. No. 684,120
Int. Cl.² A61F *5/44*
U.S. Cl. 128—283 **7 Claims**

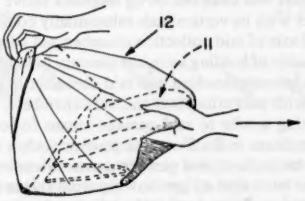


1. A colostomy bag pad adapted to be interposed between the colostomy bag and the stoma, comprising a laminate including two opposing sides formed of at least one layer of a liquid permeable sheet, at least one layer of a liquid impermeable sheet disposed in opposing relation between said two opposing sides, a liquid absorbent substance sandwiched between said liquid permeable and liquid impermeable layers, said laminate having an aperture therein and a slit communicating between said aperture and one lateral edge of said laminate, wherein each of said layers is formed of a single sheet folded substantially in half to form said laminate.

4,085,753
DISPOSABLE DIAPER WITH INTEGRAL DISPOSAL BAG
Dale Albert Gellert, Aurora, Ind., assignor to The Procter & Gamble Company, Cincinnati, Ohio
Continuation of Ser. No. 498,268, Oct. 20, 1965, Pat. No. 3,877,432. This application Apr. 14, 1975, Ser. No. 567,896
Int. Cl.² A61F *13/16*
U.S. Cl. 128—284 **1 Claim**

1. A damp resistant diaper ensemble in the configuration of a flat elongated rectangle, said ensemble having a means for manual eversion of a bag to enclose a used damp diaper comprising a diaper having on one half length, at least one adhesive means across the width thereof, a water resistant bag of sheet material of a size substantially coextensive of the diaper and having an opening in a first end portion and attached on the outside surface adjacent its second end portion to said diaper

adhesive means, said outside surface of said bag adjacent its opening and the diaper second half being joined by an adhesive tack means to define a disengageable attachment means between the bag and diaper whereby said bag opening defines a



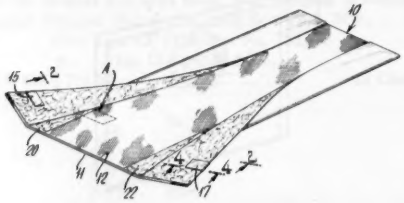
hand insertion means so said diaper second half portion may be readily detached from the bag, folded over the remaining first portion to cover the soiled surfaces, and be enclosed in the bag by said manual eversion thereof.

4,085,754

DISPOSABLE DIAPER INNER FACING

Irving Stanley Ness, Princeton Borough, and Michael R. Fechillas, East Brunswick, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 3, 1976, Ser. No. 663,323
Int. Cl.[2] A41B *13/02*
U.S. Cl. 128—287 **6 Claims**



1. In a disposable diaper of the type having a fluid impervious outer facing, a fluid pervious inner facing, an absorbent core between said facings and adhesive tabs for fastening the diaper around the wearer thereof, an improved inner facing comprising a porous nonwoven fabric having at least one entire surface thereof being treated with a water insoluble adhesive release agent whereby that surface is capable of being a releasable surface for said adhesive tape tabs, said porous nonwoven fabric having a multiplicity of openings therethrough, which are substantially uniformly arranged and sufficiently large to allow fluid to pass through after said fabric has been treated with a water insoluble adhesive release agent, causing said treated fabric to be pervious to fluid.

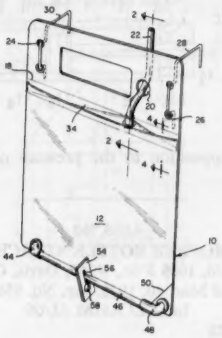
4,085,755

URINARY DRAINAGE BAG

Benjamin Stuart Burrage, 94 Lingarde Dr., Scarborough, Ontario, Canada (M1R 1X9)

Continuation-in-part of Ser. No. 681,394, Apr. 29, 1976, abandoned. This application Sep. 1, 1977, Ser. No. 829,965
Int. Cl.[2] A61F *5/42*
U.S. Cl. 128—295 **9 Claims**

1. A fluid drainage bag comprising a first ply, a second ply, a fold in said first ply, a hollow fitting provided at said fold and forming a drainage opening through said first ply into said bag, a resilient self closing flap valve for closing said drainage opening, a flexible drainage tube secured to said fitting and means for flexing a portion of said drainage tube between said fitting and the upper end of said bag, the flexed portion of said drainage tube opening said fold and drawing said flap valve away from said second ply to permit free opening of the flap valve in a manner so as to preclude sticking in the open position to the second ply, the arrangement being such that said fitting is inclined from the horizontal and said flap valve is



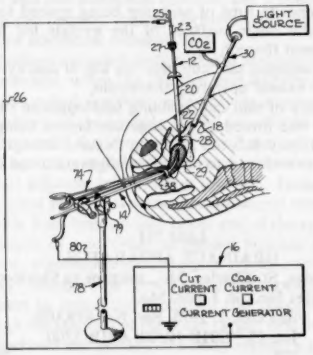
inclined from the vertical so that fluid draining through said drainage tube flows down through said fitting onto said flap valve which opens under the weight of the fluid.

4,085,756

METHOD AND APPARATUS FOR PERFORMING AN ELECTROSURGICAL PROCEDURE

Kenneth Weaver, 1511 N. Main St., Waynesville, N.C. 28786

Continuation-in-part of Ser. No. 594,203, Jul. 9, 1975, Pat. No. 4,000,743. This application Sep. 30, 1976, Ser. No. 728,122
Int. Cl.[2] A61B *17/36*
U.S. Cl. 128—303.17 **12 Claims**



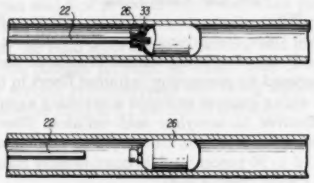
6. In an electrosurgical apparatus useful, for example, in sterilizing a human female by cutting and coagulating the fallopian tubes, and having an active terminal, a ground terminal, and a high frequency current generator operatively connected to each of the active and ground terminals, the improvement wherein said ground terminal comprises

an elongate rod having a forward end portion adapted to be inserted through the vagina and into an operative position in the uterine cavity, and a rearward end portion adapted to remain outside the body when the forward end portion is in said operative position, and with at least said forward end portion being fabricated of an electrically conductive material, whereby the electrosurgical current employed in the procedure is collected by said forward end portion and thus passes a relatively short distance through the body of the patient to minimize the opportunity for burns or other injury.

4,085,757
MINIATURE BALLOON CATHETER METHOD AND APPARATUS

Paul H. Pevsner, 4121 King Crest Pkwy., Richmond, Va. 23221

Filed Apr. 29, 1976, Ser. No. 681,676
Int. Cl.[2] A61M 25/00
U.S. Cl. 128—325 10 Claims



1. A miniaturized balloon catheter assembly for use in small vessels comprising:

a cannula having proximal and distal ends including an attaching means at the proximal end thereof for attaching to a source of pressurized fluid and having a small outer diameter for insertion into small vessels;

an inflatable balloon including a means forming a mouth at a proximal end thereof mounted on an external surface of the cannula at the distal end of the cannula to be in fluid communication therewith, the cannula and balloon together adapted to be carried by the fluid in a vessel to desired locations therein, whereupon attachment of the cannula fluid source of pressurized fluid and introduction of amounts of pressurized fluid flow inflate the balloon to fix it in position against the wall of said vessel at a desired location; and,

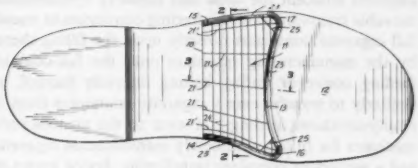
a balloon-retaining means responsive to a predetermined further amount of pressure to initiate a desired procedure within the small vessels, said balloon-retaining means including a resilient contracting member surrounding said means forming said mouth for holding said means forming said mouth on said external surface of said cannula, said resilient contracting member being constructed to have a specific predetermined internal size when in a contracted state for: contracting with a uniform predetermined tension about said means forming said mouth when said means forming said mouth is mounted on said cannula to hold said balloon on said cannula upon said balloon being inflated to fix it in position against the wall of said vessel at said desired location, expanding in response to said predetermined further amount of pressure in said balloon to release said cannula from said mouth, and thereafter contracting toward said specific predetermined internal size to close said balloon mouth and thereby retain said inflated balloon fixed in position against said wall.

4,085,758
WEIGHT-REDISTRIBUTION ORTHOPEDIC APPLIANCE

Ignatius F. Castiglia, New York, N.Y., assignor to Lenox Hill Brace Shop, New York, N.Y.

Filed Nov. 15, 1976, Ser. No. 742,146
Int. Cl.[2] A61F 5/14
U.S. Cl. 128—589 12 Claims

1. A weight-redistribution orthopedic appliance comprising a non-resilient pad, said non-resilient pad including a securing surface adapted to be secured to the bottom of the sole of a shoe, forward of the break line of the sole said pad including an outer surface facing in substantially the same direction as the bottom of the sole of the shoe to which the securing surface is secured, and including slits selectively disposed in at least said



outer surface of said pad for contouring said non-resilient pad to flexibly conform to said shoe sole, said slits being disposed in said outer surface and oriented into a first group of slits substantially parallel to a longitudinal axis of said pad and a second group of slits substantially transverse to said longitudinal slits.

4,085,759
AUTOMATIC APPARATUS FOR TRANSFERRING CIGARETTE CONTAINERS FROM DEVICES ARRANGED TO FILL SUCH CONTAINERS TO HOPPER LOADING MECHANISMS IN PACKAGING MACHINES FOR FORMING PACKETS OF CIGARETTES

Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa Per Azioni, Italy

Filed Dec. 4, 1975, Ser. No. 637,665
Claims priority, application Italy, Dec. 11, 1974, 3560 A/74
Int. Cl.[2] A24C 5/35
U.S. Cl. 131—25 9 Claims

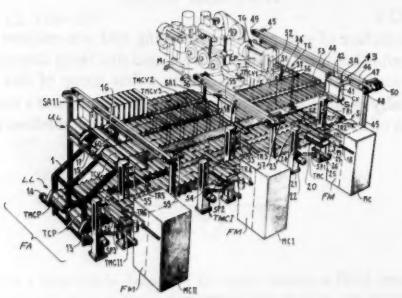
1. A system for manufacturing and packeting cigarettes and for feeding containers for them between manufacturing and packeting areas and for compensating operating unbalances of cigarette manufacturing and packeting operations, comprising:

a group of *n* cigarette manufacturing machines, each having means for filling empty cigarette containers with newly manufactured cigarettes;

a cigarette packeting machine for packeting cigarettes received in the full cigarette containers from the several manufacturing machines at an output speed *v* substantially equal to a sum of operating speeds of the manufacturing machines, each operating speed being substantially equal to *v/n* and the packeting machine having, for feeding it with the cigarettes, a grouping hopper having a loading mechanism for loading it by emptying full cigarette containers into the hopper and by discharging empty cigarette containers;

a feeding conveyor system having a full-container feeding conveyor intermittently movable in successive steps past the manufacturing machines in a direction toward the loading mechanism for feeding the full cigarette containers to said mechanism, the feeding conveyor system also having an empty-container feeding conveyor parallel and adjacent to the full-container feeding conveyor and similarly movable synchronously with the same in a direction from said mechanism past the manufacturing machines for feeding the empty cigarette containers to the latter machines;

a feeding transfer system having primary container transferring device groups, one for each manufacturing machine, disposed adjacent the same and similarly synchronously movable transversely of the feeding conveyors to transfer full cigarette containers directly upon the filling thereof by the manufacturing machines onto the full-container feeding conveyor during halting intervals thereof, and similarly to transfer empty cigarette containers from the empty-container feeding conveyor to the manufacturing machines for filling with newly manufactured cigarettes, and a secondary container transferring device group disposed adjacent the loading mechanism of the grouping hopper and similarly synchronously movable for correspondingly similarly transferring full and empty cigarette containers between that mechanism and the feeding conveyor system;



a storage conveyor system having elongate full-container storage conveyor means and similar empty-container storage conveyor means both parallel and adjacent the feeding conveyors and intermittently, synchronously with the feeding conveyors, movable in movements along the same, each storage conveyor means in either direction of the feeding conveyors; and

a conveyor transfer system having container transferring apparatus disposed adjacent the several conveyors and similarly synchronously movable for transferring full and empty cigarette containers between the respective feeding and storage conveyors during halting intervals thereof, and memory means controllable by presence and absence of cigarette containers on successive portions of the several conveyors for controlling the storage conveyor system and the conveyor transfer system to automatically effect the movements of the storage conveyor means in the direction of one of the feeding conveyors, and the transferring of the containers between the conveyors so as to compensate for operating unbalances of the several machines.

4,085,760

TOBACCO FILTER

Iwao Toyoshima, Tondabayashi; Kunio Ishii, Himeji; Hideo Sawada, Osaka; Junji Kawamoto, Sakai, and Hiromu Yokota, Himeji, all of Japan, assignors to Daicel Ltd., Sakai, Japan

Filed Sep. 10, 1976, Ser. No. 722,131

Claims priority, application Japan, Sep. 19, 1975, 50-113222; Dec. 12, 1975, 50-148299

Int. Cl.[2] A24B *15/027*

U.S. Cl. 131—268 **8 Claims**

1. A tobacco filter comprising a mass of cellulose acetate fibers which are not completely soluble in acetone and which have been prepared by contacting cellulose fibers in the solid fibrous state, with a gaseous or liquid acetylating agent, under conditions effective to acetylate said cellulose fibers to an average degree of acetylation, calculated as combined acetic acid, of from 10 to 50 percent, while continuously maintaining said fibers in a solid fibrous state.

4,085,761

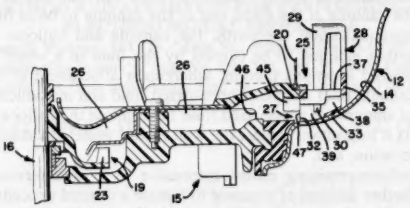
DRAIN FILTER FOR A DISHWASHING MACHINE

Ernst Grunewald, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed Oct. 6, 1976, Ser. No. 730,134

Int. Cl.[2] B08B *3/02*

U.S. Cl. 134—104 **5 Claims**



1. A dishwashing machine including a drain filter for filtering out certain waste items when the dishwashing machine is being drained, the dishwashing machine having a tank, a drain pump for draining water from the tank, a drain conduit having an opening into the tank for sealing against the drain filter for receiving filtered fluid therefrom and conveying it to the drain pump, a sump in the bottom of the tank, and a motor/pump assembly for recirculating water from the sump onto dishes supported within the tank, the drain filter comprising:

(a) a two portion filter body dimensioned to be seated on said sump, one of said portions being fixed thereon and the other removable,

(b) manually operable means for attaching and releasing said removable filter portion to and from said fixed filter portion in a predetermined position with respect thereto and in the fluid flow path between the dishwasher tank and the drain conduit, and

(c) each portion of said drain filter separately including its own:

(i) base,

(ii) body portion extending upwardly from the respective said base,

(iii) means defining a first inlet opening into the respective said body portion located at a predetermined position above the respective said base,

(iv) means forming an outlet opening through the respective said drain filter portion,

(v) means forming labyrinthine passageways connecting said first inlet opening to said outlet opening through each said drain filter portion, said passageways being dimensioned and shaped to pass items up to a first predetermined size and to block passage of larger items,

(vi) means forming a second inlet opening into the respec-

tive said body portion extending to the bottom thereof, and

(vii) means connecting said second inlet opening to said outlet opening and being dimensioned to pass items up to a second predetermined size and to block passage of larger items, said second predetermined size being substantially smaller than said first predetermined size,

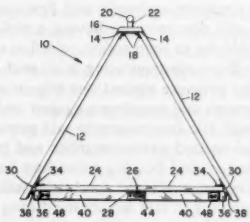
said drain filter rapidly draining fluids and suspended debris smaller than said first predetermined size when the fluid level is above said predetermined position, and continuing to drain fluids after the fluid level has fallen below said predetermined position, the passage through the drain filter of debris larger than said second predetermined size being effectively terminated when the fluid level has fallen therebelow.

4,085,762

FOLDING, RIGID, TENT-LIKE STRUCTURE

Edward D. O'Brian, 910 Iroquois, Anaheim, Calif. 92801, and William M. Plachy, 3353 San Marcos Blvd., Los Angeles, Calif. 92069

Filed Apr. 12, 1977, Ser. No. 786,824
Int. Cl.² A45F *1/16*
U.S. Cl. 135—4 R **5 Claims**



1. A folding, rigid, tent-like structure useful for play purposes which comprises:

a pair of rigid sides, each of said sides having a top edge and a bottom edge,

connecting means attached to said top edges of said sides for pivotally connecting said sides so that they may be pivoted relative to one another between a folded position in which said sides are adjacent to one another and an expanded position in which said sides are at an angle to one another,

a pair of bottom walls located between said sides, each of said bottom walls having a side edge located adjacent to a bottom edge of one of said sides and center edges, said center edges being located adjacent to one another,

a side edge hinge means connecting the side edge of each of said bottom walls to the adjacent of said sides,

a center edge hinge means connecting said center edges of said bottom walls to one another,

said side edge and said center edge hinge means being located so as to permit said bottom walls to be pivoted so as to lie adjacent to one another between said sides when said sides are in said folded position,

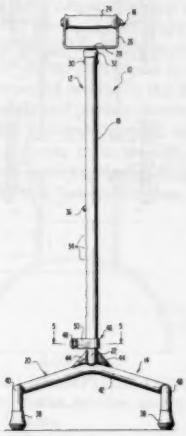
folding link means attached to said sides and extending beneath said bottom walls for limiting the amount said sides can pivot relative to said connecting means away from one another and for supporting said bottom walls when said sides are in said expanded position so that said bottom walls are coplanar.

4,085,763

QUAD CANE

Morton I. Thomas, Nyack, N.Y., assignor to Temco Products, Inc., Passaic, N.J.

Continuation-in-part of Ser. No. 683,978, May 6, 1976, Pat. No. 4,056,115. This application Sep. 2, 1976, Ser. No. 719,741
Int. Cl.² A45B *9/04*
U.S. Cl. 135—69 **2 Claims**



1. A quad cane apparatus comprising:

an upper section having a handle and a hollow sleeve attached thereto, said hollow sleeve including a plurality of apertures therein;

a lower section including a tubular means received by said hollow sleeve in an interlocking telescoping relationship;

a foot portion attached to said tubular means, said foot portion including four feet having rubber-like tips;

a locking means for locking said hollow sleeve relative to said tubular means, said locking means comprising a spring-loaded button at least partially housed inside of said tubular means, said spring-loaded button being adapted to pop through one of said apertures in said hollow sleeve; and, a stabilizing means including:

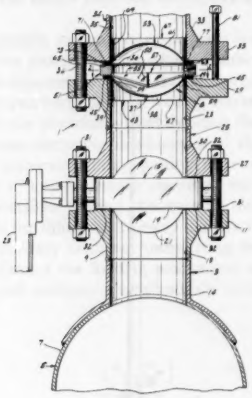
a collar attached to said hollow sleeve, said collar including a threaded hole therethrough, said threaded hole being located opposite one of said apertures in said hollow sleeve; and,

a connecting means for selectively connecting said collar to said tubular means through at least one of said apertures in said hollow sleeve, said connecting means comprising a wing-type threaded screw-like means threadably received in said threaded hole, the threads of said threaded screw-like means including a stop means thereon so that said threaded screw-like means cannot back out of said threaded hole, said collar further including a first section through which a portion of said threaded screw-like means is visible, a second approximately annular section with a diameter slightly less than the outside diameter of said hollow sleeve, and a third relief section for accomodating the flow of said hollow sleeve when said apparatus is assembled on said hollow sleeve.

4,085,764
APPARATUS FOR PROTECTING A GAS PRESSURE SYSTEM FROM OVER PRESSURE

John H. Raidl, Jr., 6625 Milhaven Dr., Shawnee Mission, Kans. 66202

Filed Oct. 20, 1975, Ser. No. 623,593
Int. Cl.[2] F16K *17/40*
U.S. Cl. 137—68 R 14 Claims

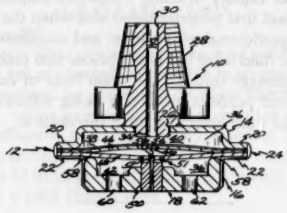


1. Apparatus for protecting a fluid pressure system from over-pressure comprising an assembly of a reverse acting rupture disk means, knife means, a spacer ring, and a prebulged rupture disk means adapted to be sealingly mounted in an outlet of said system between inner and outer companion flanges of the outlet, said reverse acting rupture disk means having a part spherical, thin rupturable dome and a generally flat annular flange surrounding the dome and integral therewith, the flange of the reverse acting dome fitting on the inner flange of the said outlet with said dome being directed upstream in said outlet for exposure of the convex face of the reverse acting rupture dome to the system fluid pressure, said reverse acting dome being adapted to snap over center from a convex to a concave configuration upon said system fluid pressure exceeding a predetermined pressure level, said spacer ring fitting on the face of said flange of said reverse acting dome opposite said inner flange of said outlet, said knife means being carried by said spacer ring for cutting said reverse acting dome as the latter snaps over center, said prebulged rupture disk means comprising a part spherical, thin rupturable dome and an annular flange surrounding said prebulged dome and being integral therewith, one face of said annular flange of said prebulged dome fitting on the other face of said spacer ring and the other face of the last-said annular flange fitting on the outer flange of said outlet with the concave face of said prebulged dome facing the concave face of said reverse acting dome whereby said prebulged dome is adapted to burst upon its concave face being subjected to said system fluid pressure as occassioned by the rupture of said reverse acting dome, said outlet having a circular bore, and said apparatus further comprising guide means for alignment of said dome of said reverse acting rupture disk means with respect to the bore of said outlet, said guide means comprising a tubular sleeve of somewhat smaller diameter than the diameter of said bore of said outlet, said sleeve being secured to said annular flange of said reverse acting dome and extending into said bore whereby said sleeve centers said reverse acting dome with respect to said bore.

4,085,765
PRESSURE RELIEF VALVE

Kris L. Nelson, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 3, 1976, Ser. No. 682,545
Int. Cl.[2] F16K *17/40*
U.S. Cl. 137—68 R 7 Claims

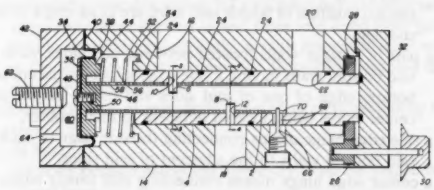


1. A pressure responsive device comprising a housing with first and second casing members, said first casing member providing a first cavity and said second casing member providing a second cavity, a membrane positioned intermediate said first and second casing members, a pressure responsive snap-acting disc member positioned adjacent said membrane, said member formed with an aperture therethrough, said member substantially coextensive in area with said membrane, said membrane and said disc member being secured at their marginal periphery between said first and second casing members, said membrane separates and seals said first cavity from said second cavity, said disc member having a deformed portion therein responsible for its snap action, said first casing member providing an orifice communicating with said first cavity to admit fluid under pressure against one side of said membrane directly and through said membrane against said disc to effect snap action of said disc in response to said pressure in a direction toward said second casing member and piercing means securely mounted in said housing extending into said second cavity in axial registry with said aperture in said disc member to provide for piercing of said membrane during snap action of said disc to vent said pressure source.

4,085,766
ADJUSTABLE GAS MIXING VALVE

James Weigl, and Leo James Lichte, both of Riverside, Calif., assignors to Bourns, Inc., Riverside, Calif.

Filed Apr. 15, 1976, Ser. No. 677,344
Int. Cl.[2] F16K *11/00*
U.S. Cl. 137—88 1 Claim



1. A gas mixing valve for a medical respirator comprising:
a manifold having at least two gas inlet portals for receiving gases to be mixed and an outlet portal providing exit for gases so mixed;
a cap attached to and sealing one end of said manifold so as to prevent escape of gas;
a cup-shaped housing member secured to and sealing another end of said manifold so as to prevent escape of gas;
a hollow, cylindrical sleeve movably lodged within said manifold and having at least two gas inlet ports formed by

notches cut into diametrically opposite sides of said sleeve and also having an outlet port;

a gear assembly mounted at one end of said sleeve comprising a driven gear attached on the outer circumference of said sleeve engaged by a drive gear housed within said manifold and controlled by a knob attached thereto so as to rotate said sleeve about its longitudinal axis within said manifold;

sealing means for preventing fluid communication between said sleeve and said manifold along mutual longitudinal dimensions thereof except at said portals and said ports;

a hollow, open-ended, cylindrical piston slidably lodged within said sleeve having at least two openings formed from notches cut into said piston such that a notch forming a first opening is cut into said piston at an angle approximately perpendicular to a notch forming a second opening, for receiving gases to be mixed from the inlet ports of said sleeve;

a plug having a cylindrical boss and secured thereby at one end of said piston;

a diaphragm comprising a flat central portion, a flexible, resilient convolution and a flat peripheral flange, secured between one end of said manifold and said cup-shaped housing member at said flat peripheral flange, said flat central portion being secured to said plug by means of a bolt and a flat plate;

an inner compartment formed in the wall of said manifold and further bounded by said plug, one side of said diaphragm an end of said sleeve and said piston, said piston having an opening providing fluid communication between said inner compartment and the interior of said piston;

an outer compartment formed in said cup-shaped housing member and further bounded by the other side of said diaphragm and the flat plate attached to said diaphragm;

a settable screw threaded into said cup-shaped housing member for adjusting the allowable travel of said diaphragm;

an orifice in said cup-shaped housing for the introduction of a reference pressure into said outer compartment;

a pin threaded into said manifold and projecting into a longitudinal slot formed at the open end of said piston through a partial circumferential opening formed in said sleeve; and

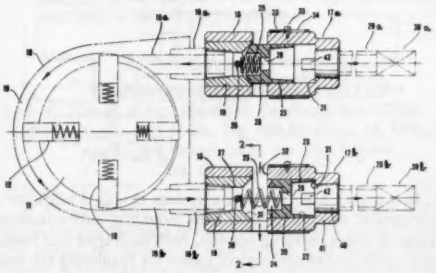
a coil spring located in said inner compartment in compression so as to bear against an interior wall of said manifold and said plug so as to urge said plug and thus said diaphragm into said outer compartment.

4,085,767

REVERSE FLOW VALVE FOR PNEUMATIC SYSTEMS

James Whitman Gibbs, Hialeah, Fla., assignor to Gibbs-Ryder Materials Handling Systems, Inc., Hialeah, Fla.

Filed Nov. 21, 1975, Ser. No. 634,135
Int. Cl.[2] F16K *45/00*; G05D *11/03*
U.S. Cl. 137—102 **12 Claims**



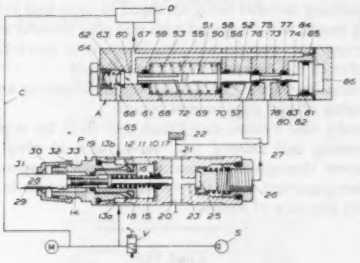
1. A reversible valve for selectively delivering a pressurized gaseous mixture to and exhausting it from a pressure operated device comprising; housing means having bore means therein, a pair of spaced port means in said housing means, one of said pair of spaced port means connected with the pressure operated device, lateral exhaust opening means in said housing means interposed between said pair of spaced port means, a piston axially movable in said bore means of said housing means to open and close said exhaust opening means, flow port means in said piston establishing flow communication for the gaseous mixture through said bore means in said housing means between said pair of spaced port means, diverter means in said bore means of said housing means and positioned between said one of said pair of spaced port means and lateral exhaust opening means directing flow of gaseous mixture from the pressure operated device to said exhaust opening means in said housing means, and biasing means operative with flow of gaseous mixture from the pressure operated device through said one of said pair of spaced port means to move said piston to open said exhaust opening means for the discharge of gaseous mixture therethrough, said piston movable with flow of the gaseous mixture to the pressure operated device against the action of said biasing means to close said exhaust opening means and transmit the gaseous mixture through said pair of spaced port means and said flow port means.

4,085,768

PRESSURE FLUID IMPULSE CONVERTER

Ulf Einar Sigvard Norr, Nacka, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Sep. 15, 1976, Ser. No. 723,314
Claims priority, application Sweden, Sep. 17, 1975, 7510374
Int. Cl.[2] F16K *31/124*
U.S. Cl. 137—102 **9 Claims**



1. A pressure fluid impulse converter for transforming, at a predetermined rate, primary pressure fluid impulses of a higher frequency into secondary pressure fluid impulses of a lower frequency, in which the improvement comprises:

a positive displacement hydraulic pump (P) actuated by the primary pressure fluid impulses, the displacement of the hydraulic pump (P) being variable.

a pressure fluid supply valve (**61**) activatable from a closed to an opened position, to provide secondary pressure fluid impulses when activated to its opened position,

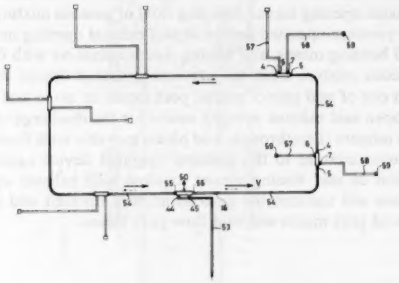
an activating means (**51**) actuatable by pressure fluid from said hydraulic pump (P), said activating means (**51**) having a substantially larger displacement than said pump (P), and being arranged to be stepwise displaced by repeated strokes of said pump (P) so as to activate said valve (**61**) to its opened position after a predetermined number of said pump strokes, and

means for varying the displacement of said pump (P) to thereby vary the impulse frequency transforming rate.

4,085,769
FLUID DISTRIBUTION SYSTEM

Lourens Theodor van Haaften, Plantsoen Laanhorn 18, Amstelveen, Netherlands

Filed Mar. 8, 1976, Ser. No. 664,484
Claims priority, application Netherlands, Mar. 17, 1975, 7503122; Apr. 1, 1975, 7503836
Int. Cl.[2] A01G *27/00*
U.S. Cl. 137—119 **19 Claims**



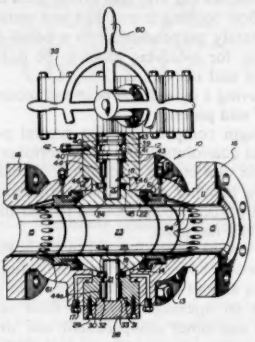
1. A system for distributing a fluid supplied under pressure comprising:
   a. a conduit for conducting said fluid;
   b. a plug element within said conduit and moveable therethrough;
   c. a plurality of valves arranged along said conduit, each of said valves having an outlet and a valve closing means which may be selectively opened and closed for distributing said fluid through said outlet, said valve closing means including a plug receiving member;
   d. engagement means for selectively engaging and disengaging said plug and said plug receiving member, said plug receiving member being arranged to open said valve closing means when engaged with said plug element and being arranged to permit said plug element to move from one valve to the next when disengaged; and
   e. means for selectively controlling the engaging and disengaging of said engagement means;
   whereby said system distributes said fluid by sequentially opening and closing said valves as said plug element moves through said conduit and into engagement and disengagement with the valve closing means in each of said plurality of valves.

4,085,770
SEAT AND TRUNNION ASSEMBLIES FOR ROTARY VALVES

Romuald Woronowicz, 13324-126 Avenue, Edmonton, Alberta, Canada (T5L 3E1)

Filed Apr. 21, 1976, Ser. No. 678,925
Claims priority, application Canada, Dec. 5, 1975, 241168
Int. Cl.[2] F16K *5/20, 5/22*
U.S. Cl. 137—238 **28 Claims**

1. A plug valve comprising:
   a. a valve body having a valve chamber and inlet and outlet flow passages disposed in fluid communication with said valve chamber;
   b. a plug member rotatably disposed within said valve chamber and having a flow passage extending through it for alignment with said inlet and outlet passages in the open position of said valve;
   c. means for imparting rotation to said plug member between the open and closed positions thereof;
   d. a seat recess formed in said valve body about at least one of said inlet and outlet flow passages and adjacent to said valve chamber, in axial alignment with said flow passage, the interior surface of said seat recess being joined to the interior surface of said flow passage by a generally radially extending shoulder surface;
   e. a seat assembly disposed in said recess and axially movable toward and away from said plug member, said seat assembly including a resilient sealing member disposed therein in sealing engagement with said plug member;
   f. means establishing a fluid-tight seal between said valve body and said seat assembly;
   g. means urging said seat assembly toward said plug member;
   h. the end of said seat assembly axially remote from said plug member terminating in a generally radially extending

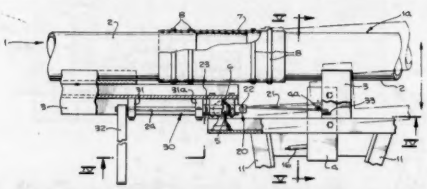


shoulder surface disposed adjacent to, and generally coextensively with, said radially extending shoulder surface of said seat recess, whereby the motion of said seat assembly in an axial direction away from said plug member is limited;
   i. at least one fluid conduit extending through the valve body from the interior surface of said flow passage to the said radially extending shoulder surface of said seat recess, thereby providing means for fluid passage between the said surfaces; and
   j. means permitting fluid passage between said valve chamber and the outlet of said conduit on said radially extending surface of said seat recess.

4,085,771
ANGULARITY SENSOR MEANS FOR CENTER PIVOT IRRIGATION SYSTEM

Edwin J. Hunter, Rancho Santa Fe, Calif., assignor to The Toro Company, San Marcos, Calif.

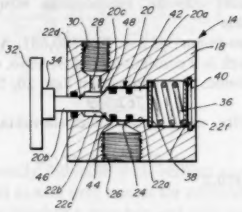
Filed Oct. 12, 1976, Ser. No. 731,695
Int. Cl.[2] B05B *3/12*
U.S. Cl. 137—344 **9 Claims**



1. In a center pivot irrigation system having a plurality of self-propelled articulated span units mounting inter-connected sections of water carrying conduit, each such span unit having motor means and motor control means for regulating the operation of the associated motor means to maintain said span units in a pre-determined relative alignment, the improvement in control means comprising the provision of:
   angularity sensor means operable between at least one of said span units and an adjacent span unit and connected

with the motor control means of one of said span units for sensing changes in angularity between said span unit and said adjacent span unit, said angularity sensor means having means for sensing said changes in angularity relative to a plane truely vertical to the earth.

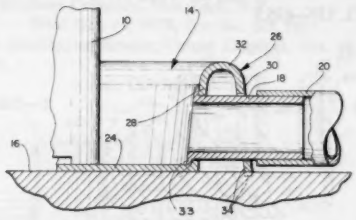
4,085,772
VALVE ASSEMBLY
Harry Roger, 702 Florence, Lot 43, Lafayette, La. 70501
Filed May 17, 1976, Ser. No. 686,837
Int. Cl.² F16K *17/00*
U.S. Cl. 137—464 **13 Claims**



1. A valve assembly comprising:
a valve body having a bore therein, a first opening communicating with said bore and of limited circumferential extent in said bore, and a second opening longitudinally displaced from said first opening and communicating with said bore;
a valve element slidably mounted in said bore for longitudinal movement in said bore between a first position in which said first opening is sealed from communication with said second opening and a second position permitting communication between said first and second openings via said bore, said valve element including means defining a pressure reaction area exposed to fluid pressure from said second opening in said second position whereby said valve element is retained in said second position upon the presence of fluid pressure in said second opening in excess of a predetermined limit;
annular seal means carried by said valve element and sealing between said valve body and said valve element between said first and second openings in said first position;
wherein said bore includes a substantially uniform diameter section including a portion of said bore against which said seal means seals in said first position and a portion of said bore directly intersecting said first opening;
stop means cooperative between said valve body and said valve element to retain said seal means in substantial but non-sealing alignment with said first opening in said second position; and
return means, operatively associated with said valve element, for automatically returning said valve element to said first position upon the absence of fluid pressure above said limit in said second opening.

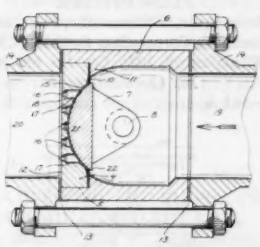
4,085,773
WATER HEATER OVERFLOW PAN
Lyle D. Tinney, R.R. 1, Box 114, Leesburg, Fla. 32748
Continuation-in-part of Ser. No. 696,566, Jun. 16, 1976. This application Oct. 6, 1976, Ser. No. 729,961
Int. Cl.² F17D *1/00*
U.S. Cl. 137—571 **6 Claims**

1. A water heater overflow pan comprising, a plastic slightly yieldable pan having a bottom wall for receiving the bottom of the heater, the bottom of said bottom wall having outer face means to be seated on a supporting surface when the heater is received on said bottom wall, said pan further having a continuous side wall including a generally upright inner wall and a generally upright outer wall interconnected at their upper portions, said outer wall having bottom edge means to be seated on the supporting surface and said bottom edge means extending slightly downwardly from said outer face means of said bottom wall to be flexed into firm seated engagement with the supporting surface as said pan yields responsive to the heater being received on said bottom wall, and a coupling



opening through said side wall for connection with a drain, said coupling being in sealed engagement with said inner wall and extending freely through said outer wall to permit free relative movement between said coupling and said outer wall as said pan and heater are seated on said supported surface.

4,085,774
ANTICAVITATION AND LOW NOISE MEANS FOR ROTARY VALVES
Hans D. Baumann, 32 Pine St., Rye, N.H. 03870
Filed Jul. 19, 1976, Ser. No. 706,541
Int. Cl.² F16K *47/08*
U.S. Cl. 137—625.3 **9 Claims**



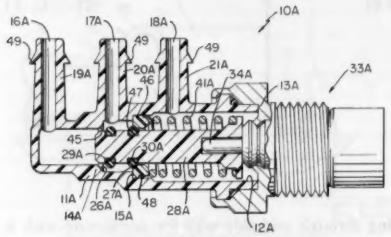
1. In a rotary valve including a body having inlet and outlet flow passages therein and a valve closure rotatably mounted therein, said closure having an arcuate convex spherical surface head portion, and cavitation resistance discharge means in said valve comprising:
a plate secured in said outlet flow passage, said plate having an inner concave spherical surface complementary and closely spaced to, the path of rotation of said convex surface head portion; and
a plurality of anti-cavitation passageways through said plate parallel to the axis of said outlet flow passage, each of said anti-cavitation passageways having an enlarged entrance portion opening from said concave surface and terminating within said plate near the downstream surface thereof, and
an exit portion of smaller cross-section communicating with said entrance portion and opening from the downstream side of said plate.

4,085,775

THREE PORT VALVE CONSTRUCTION AND METHOD OF MAKING THE SAME

Everett T. Steele, Jr., Knoxville, Tenn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed May 14, 1976, Ser. No. 686,472
Int. Cl.[2] F16K *11/02*
U.S. Cl. 137—625.5 8 Claims



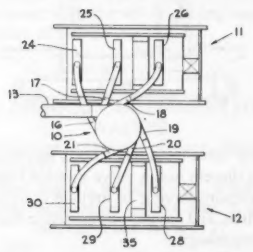
1. A three port valve construction comprising a one-piece plastic valve housing body having a stepped cylindrical opening through one end thereof that defines a pair of spaced annular shoulders, said body having three ports therein transversely disposed to said opening and respectively intersecting with said opening with one port being located between said shoulders and the other two ports being respectively disposed outboard of said shoulders, one of said shoulders being beveled and defining a first valve seat, an annular plastic valve seat member ultrasonically welded to the other of said shoulders to define a second valve seat, and an axially movable valve member slidingly disposed in said opening to control said first and second valve seats, said body having three integral nipples extending outwardly therefrom and respectively having said ports therethrough, said nipples each having integral annular barb means thereon.

4,085,776

FLOW DIVIDER

H. William Derrick, Jr., Williamsville, N.Y., assignor to Derrick Manufacturing Corporation, Buffalo, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,364
Int. Cl.[2] F15D *1/14*
U.S. Cl. 137—561 A 7 Claims



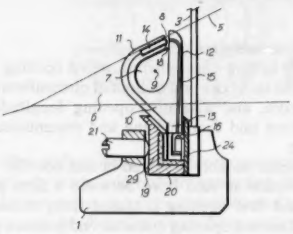
1. A flow divider for separating a stream of liquid having particles of solid material entrained or suspended therein into a plurality of streams having substantially uniform concentrations of solid particles therein, said flow divider comprising a cylindrical tank having an inlet passage for said liquid disposed at an upper portion of said tank and entering the same tangentially, a plurality of discharge passages at a lower portion of said tank and arranged to leave the tank tangentially in the direction of circular flow of said liquid in said tank, and an annular flange extending horizontally about the interior of the tank and extending radially inwardly from the wall thereof above and in proximity said outlet passages to cause the peripheral portions of the liquid and solids to flow radially inwardly whereby such portions are carried downwardly into more central portions of the liquid substantially at the level of the discharge passages and are admixed therewith in the radially outward flow of such more central portions to the discharge passages.

4,085,777

ARRANGEMENT FOR THE CONTROL OF WEFT INTRODUCED INTO LOOMS

Zdenek Dadák, Brno; Jaroslav Janda, Ceska u Brna, and Karel Kakač, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

Continuation-in-part of Ser. No. 680,681, Apr. 27, 1976, abandoned, which is a continuation of Ser. No. 491,318, Jul. 24, 1974, abandoned. This application Jan. 26, 1977, Ser. No. 762,589
Claims priority, application Czechoslovakia, Jul. 24, 1973, 5267/73
Int. Cl.[2] D03D *51/34*
U.S. Cl. 139—370.2 1 Claim



1. In an arrangement for controlling the introduction of a weft thread from a picking comb composed of a system of plates into a shed in a loom, the plates of the picking comb each having a picking opening and a slot for the removal of the weft thread, the arrangement comprising a control plate having opposed arms defining a picking opening and a fixed slot for the removal of the weft, the fixed slot communicating with the picking opening in the control plate, the control plate substantially corresponding in shape to the shape of the plates of the picking comb for insertion at a desired point of the comb, a light source and a photocell individually disposed in aligned spaced relation at opposite sides of the fixed slot adjacent the picking space of the control plate, the fixed slot being narrowed to a dimension substantially equal to the diameter of the weft thread at the location of the respective light source and photocell, the improvement wherein at least one of the light source and photocell projects into the fixed slot, whereby an exit of the weft thread through the fixed slot exerts a positive wiping action on the said one of the light source and photocell which projects into the fixed slot.

4,085,778

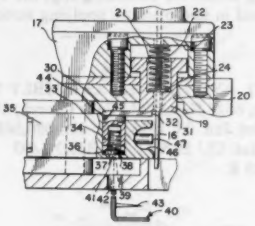
PACKAGING MACHINE

Donald R. Wright, Midland, Mich., assignor to The Kartridg Pak Company, Davenport, Iowa

Filed Apr. 5, 1977, Ser. No. 784,730
Int. Cl.[2] B65B *13/28, 51/04;* B26D *5/08*
U.S. Cl. 140—93 A 6 Claims

1. In a machine in which wire is fed and cut into pieces of predetermined lengths and the pieces formed into U-shaped clips for clinching about a constricted product-filled tube, means for varying the lengths of the cut off wire pieces, comprising: a frame or housing; a wire receiving member slidably mounted on said frame and protruding through a guide opening in said frame and having a wire cut off surface on its projecting end, said member being slidable in said guide opening

along an axis; means for feeding wire through said member as as to emerge through said wire cut off surface; a clip forming plate reciprocably mounted on said frame for forming cut off pieces of wire into U-shaped clips, said plate being reciprocable in a direction transverse to said axis; a knife blade mounted on said plate and with a wire shearing edge having transverse sliding engagement with said wire cut off surface, said knife



blade being laterally movable with respect to said plate in a direction parallel to said axis; means for adjustably positioning one of said wire receiving member and said knife blade; and, spring means maintaining said wire shearing edge and said wire cut off surface in wire cutting engagement as said wire receiving member is moved on said axis and said knife blade is moved with respect to said plate in a direction paralleling said axis.

4,085,779

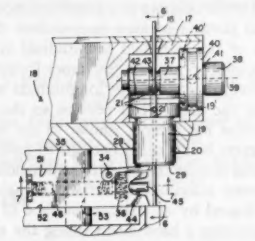
PACKAGING MACHINE

Roy E. Wells, Maquoketa, Iowa, assignor to The Kartridg Pak Company, Davenport, Iowa

Filed Apr. 6, 1977, Ser. No. 785,119

Int. Cl.[2] B65B *13/28, 51/04;* **B26D** *5/08, 5/18*

U.S. Cl. 140—93 A **10 Claims**



1. In a machine in which wire is fed by wire feeding means and cut into pieces of predetermined lengths which are formed into U-shaped clips and clinched about a constricted product-filled tube, said machine having a wire cut off and clip forming unit including frame means providing a channel in which a combination cut off block and clip forming plate is reciprocable, means for varying the lengths of said pieces of wire, comprising: a wire receiving member slidably mounted on said frame means on an axis extending perpendicular to the direction of reciprocation of said wire cut off block and clip forming plate; positioning means carried by said frame means and operably connected with said wire receiving member for adjusting the extent to which member protrudes into said channel towards one side of said cut off block and forming plate, the protruding portion of said member having a wire cut off end surface through which wire emerges from said member into said channel; a wire cutting blade having a shearing edge pivotally mounted on said one side of said cut off block and forming plate; and spring means acting between said blade and said cut off block and forming plate to maintain the shearing edge of said blade in engagement with said wire cut off end surface during reciprocation of said cut-off block-forming plate.

4,085,780

LIQUID DISPENSING MEANS

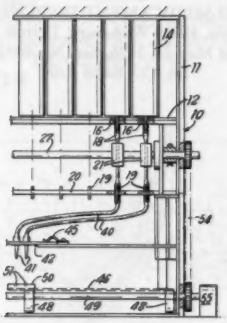
John Ernest Foster Holley, Westerham, England, assignor to Lever Brothers Company, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,797

Claims priority, application United Kingdom, Oct. 14, 1974, 44493/74

Int. Cl.[2] B65B *3/04*

U.S. Cl. 141—1 **12 Claims**



10. A method of dispensing liquid to wells of a multi-well tray, the method comprising the steps of relatively moving the tray and a two-dimensional array of nozzles from a first position, in which said tray and said array of nozzles are spaced apart to permit loading of the tray onto support means therefor, to a second position in which said tray and said array of nozzles are in proximity whereby each well of the tray is located in registration with a respective one of the nozzles, supplying a predetermined quantity of liquid from a respective one of an array of pumps to each of the nozzles so as to provide a droplet suspended thereon, transferring each droplet to its associated well by contact with the well when said tray and array of nozzles are moved to said second position, and stopping the pump and relatively moving the tray and the array of nozzles to the first position for unloading the tray from said support means.

4,085,781

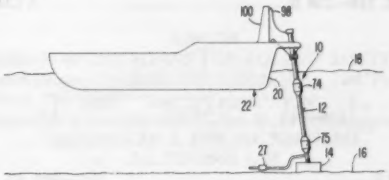
MATERIALS DELIVERY SYSTEM FOR OFFSHORE TERMINAL AND THE LIKE

Luis B. Serpas, Belmont; Sam W. Small, Walnut Creek, and Frederick S. Ellers, Menlo Park, all of Calif., assignors to Bechtel International Corporation, San Francisco, Calif.

Filed May 13, 1976, Ser. No. 685,966

Int. Cl.[2] B65B *3/00*

U.S. Cl. 141—1 **49 Claims**



32. A method of transferring materials from the bottom of a body of water to a floating materials receiver near the water surface comprising: providing a tubular spar defining a materials delivery path between the bottom of said body of water and

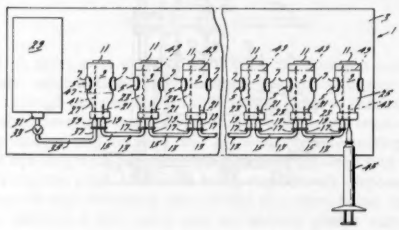
a location adjacent to the water surface with the upper end portion of said path being capable of lateral movement relative to the lower end portion of the path; coupling the upper end portion of said spar to the materials receiver and applying an upward force on the spar with the source of the force being on the materials receiver to maintain the upper end portion of said spar in a generally fixed location relative to said materials receiver as the latter rotates about and pitches relative to said path; and directing a mass of materials along said path while permitting said materials receiver to rotate about and to pitch relative to said path.

4,085,782

VACCINE AND MEDICAMENT DISPENSING SYSTEM

Harold W. Carlson, 18070 Wildemere, Detroit, Mich. 48221

Filed May 24, 1976, Ser. No. 689,008
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—1 **4 Claims**



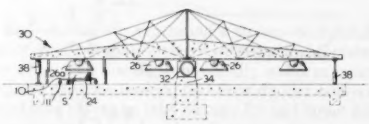
3. The method of increasing the efficiency with which syringes are filled with liquid vaccine or medicament which comprises arranging a multiplicity of conventional vials containing said liquid so that the vials are upside down with the liquid resting on the penetratable self sealing membrane in the vial, inserting syringe-type needles through the membrane, attaching tubing to said needles and interconnecting said vials in series relationship so that liquid flows in series from one vial to the adjacent vial in a direction from the first to the last of the vials in the series, supplying a fluid at a pressure slightly above ambient to the first in said series of vials to thereby pressurize the liquid in the vial-conduit system, and withdrawing liquid from the last of the vials by insertion of a syringe into the last of said vials to fill said syringe with a desired amount of said liquid.

4,085,783

PROCESS AND APPARATUS FOR LOOSENING BARK FROM LOGS

Charles A. Jones, 26 Gladstone Ave., Oshawa, Ontario, Canada

Continuation of Ser. No. 544,547, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 510,942, Oct. 2, 1974, abandoned. This application Sep. 27, 1976, Ser. No. 727,117
Claims priority, application United Kingdom, Oct. 3, 1973, 47157/73
Int. Cl.[2] B27L *1/00*
U.S. Cl. 144—208 R **4 Claims**



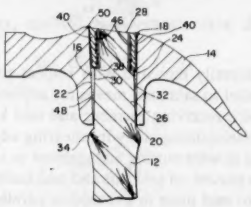
1. Apparatus for debarking of logs, including a loading station, a pressure applying station and a debarking station, and platform means for carrying a stack of logs, said platform means being mounted on wheels via spring suspension means for movement of said stack from the loading station to the pressure applying station and subsequently to said debarking station, said pressure applying station including means for supporting said platform means independently of said wheels and a pressure member with means for causing said pressure member to descend forcefully on a stack of logs on said platform means to subject the sides of the logs to compressive forces sufficient to expel juices therefrom, and said debarking station including means for debarking logs the bark of which has been loosened in said pressure applying station.

4,085,784

IMPACT TOOL ANR HANDLE ASSEMBLY THEREFOR

Herbert L. Fish, 6525 Kerns Rd., Falls Church, Va. 22044

Filed Jun. 26, 1975, Ser. No. 590,565
Int. Cl.[2] B25C *1/00*; B25D *1/00*
U.S. Cl. 145—29 R **10 Claims**



1. An impact tool comprising a head and a handle, said head having a tapered eye therethrough extending from an outer opening to a smaller inner opening, said handle having an end portion extending through said inner opening to the vicinity of said outer opening and having a longitudinal notch at at least one side of said handle end portion, said notch having a longitudinal surface extending continuously along said handle end portion from a terminal surface of said handle end portion adjacent to said outer opening to a transverse notch surface on said handle end portion located intermediate the outer and inner openings of the eye, said longitudinal surface of said notch being parallel to an adjacent taper-forming surface of said eye and diverging from the longitudinal surface of the opposite side of the handle end portion so that the notched handle end portion has a taper similar to the eye taper, said handle end portion being small enough to pass through said inner eye opening despite the taper of said handle end portion, the last-mentioned longitudinal surface of said handle end portion being braced by an adjacent surface of said eye, and said notch containing a hard insert filling the space between the longitudinal surface of the notch and the associated taper-forming surface of the eye and terminating intermediate the outer and inner openings of the eye for preventing withdrawal of the handle from the head through the inner opening of the eye.

4,085,785

INFLATABLE COOLER CONTAINER

Eric F. Hoot, Cambridge, Canada, assignor to The Raymond Lee Organization Inc., New York, N.Y., a part interest

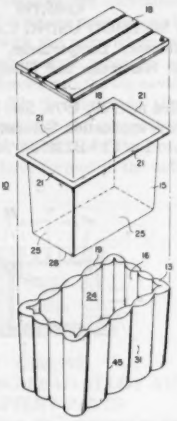
Filed Oct. 4, 1976, Ser. No. 729,280
Int. Cl.[2] B65D *31/04*
U.S. Cl. 150—.5 **1 Claim**

1. A collapsible inflatable container for use, when inflated, as a thermal insulated container in the form of an inflatable box structure, open to the top, fitted with a removable inflatable cover, in which

the box structure is formed of a continuous flexible inner side wall joined to an inner flexible bottom wall, and a continuous flexible outer side wall joined to an outer flexible bottom wall, with the said inner side wall joined to the said outer side wall by a continuous top edge wall, and with an inlet valve mounted in a said wall for use in inflat-

ing with air the spacing between said inner and said outer walls, and in which

the cover is formed with a continuous flexible outer wall joined to a continuous flexible inner wall by a flexible end wall, with said end wall shaped so as to form a flanged wall section of a shape to detachably fit over the top edge wall of the box structure and about an adjoining portion of the inner side wall of the inflated box structure, when the



interior spacing between the said cover outer and inner walls are inflated with air, together with valve means fitted to the cover for inflating said interior spacing,

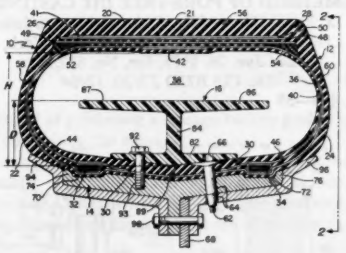
together with a plastic liner shaped as a pail of a size to detachably fit inside the said box structure and formed with a flange shaped to fit between the adjacent surfaces of the box structure and the cover, in the installed position of the liner and inflated cover to the inflated box structure.

4,085,786

INTEGRALLY BUILT AND CURED TIRE AND WHEEL ASSEMBLY

Vito A. Caravito, Uniontown, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 19, 1975, Ser. No. 633,534
Int. Cl.[2] B60C *5/00*
U.S. Cl. 152—158 **17 Claims**



1. An integral pneumatic tire and rim assembly in which said tire is of a closed torus contruction and has at least one carcass ply that is joined in the tread area to provide a circumferential splice, a circumferentially extending tread portion, said splice disposed centrally in said tread portion of said tire, a radial inner wall engaging the rim and a pair of sidewalls connecting the respective axial outer edges of the tread and radial inner wall; and said rim is an annular unitary rigid member, said assembly being further characterized by an annular unitary rigid means disposed in the cavity of a tire adjacent said radial inner wall, said annular unitary rigid means having a clamping member, an annular support member which extends circumferentially about said tire and radially outward of said clamping member and a generally cylindrical support member for supporting the tread when the tire is run in an uninflated condition and means extending between and connecting said clamping member and said rim to clamp said tire on said rim.

4,085,787

PNEUMATIC TIRE FOR A VEHICLE HAVING A RADIAL CARCASS AND IMPROVED BEADS

Luigi Maiocchi, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Jul. 12, 1976, Ser. No. 704,580
Claims priority, application Italy, Jul. 23, 1975, 25657 A/75
Int. Cl.[2] B60C *15/06*
U.S. Cl. 152—362 R **9 Claims**

1. In a pneumatic tire for vehicle wheels, provided with a radial carcass, in which each bead comprises at least a bead core of metallic wires around which carcass fabric plies are turned up, a filler having an approximately triangular elongated section arranged on each bead core, and at least a reinforcement element arranged within the axially external area of the bead and external to the turn-up of said carcass plies, consisting essentially of a metallic cord fabric strip, radially extending from a point located at about the height of said bead core up to an external point of the rim flange and to the end of the carcass ply turn-up, said filler being constituted, at least in its portion facing said reinforcement, of a compound having a hardness between 70° and 80° Shore A; the improvement wherein

said compound of hardness between 70° and 80° Shore A has a modulus at 100% (CAl) of between 65 and 85 Kg/cm^2; and

said reinforcement consists essentially of metallic cords of high elongation lang-lay type, the rigidity of said reinforcement resulting from the number of said cords per cm in the fabric and their angle of inclination to the circumferential direction of the tire, said angle of inclination being between 15° and 45°, whereby the rigidity of said filler throughout and the rigidity of said reinforcement are so combined with each other that they give rise to a tire bead having a constant rigidity gradient varying from point to point in a substantially continuous manner.

4,085,788

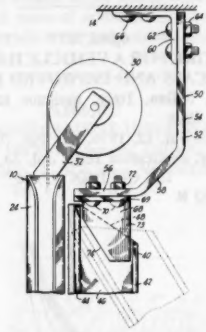
REINFORCING MEANS FOR ROLL-UP SHUTTER

Richard Gregory Bernardo, 1230 S. Dixie Hwy., East, Pompano Beach, Fla. 33060

Continuation of Ser. No. 546,039, Jan. 31, 1975, abandoned. This application Jul. 1, 1976, Ser. No. 701,953
Int. Cl.[2] E06B *9/08*
U.S. Cl. 160—133 **9 Claims**

8. In combination with a roll-up shade closure assembly mounted within an opening in a wall of a building, said closure assembly in said opening includes side frames, a floor frame connected to said side frames, and an articulated, horizontally slatted, roll-up shutter connected adjacent the top of said side

frames, and said opening having a top barrier portion, side walls, and a bottom barrier portion; a detachable interlocking vertically disposed reinforcing beam with an upper end portion and a lower end portion disposed in said opening in close proximity with said shutter; first attaching means includes a connecting member, a slotted means carried by said connecting member and means securing one end permanently to said top barrier portion between said side frames for detachably interlocking said upper end of said beam to said top barrier portion of said building and second means for locking said lower end of said beam to said floor frame, said beam solely supported by said first means and second means to provide additional independent support of the shutter.

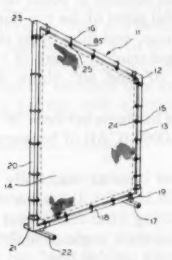


4,085,789

MODULAR WELDING SCREEN APPARATUS

Robert J. Steiner, Highland Park, and John Kuzelka, Itasca, both of Ill., assignors to Steiner Industries, Inc., Chicago, Ill.

Filed Jul. 27, 1976, Ser. No. 708,710
Int. Cl.² A47G 5/00
U.S. Cl. 160—135 **11 Claims**



1. A modular welding screen apparatus for shielding welding work locations comprising:

a plurality of welding frame panel sections,

each of said welding frame panel sections constructed of a plurality of substantially square-shaped horizontal and vertical tubular frame means connected in a substantially rectangular arrangement;

a plurality of interchangeable pivot connection means capable of alternative attachment and removal from said panel sections in a facilitated manner,

said plurality of pivot connection means pivotally hinging three or more of said plurality of welding frame panel sections together as desired for substantially free pivotal movement therebetween,

one or more of said tubular frame means providing means along the top and bottom ends of said panel section for attachment thereto of said pivot connection means;

each of said pivot connection means including a rigid connecting member directly spanning the distance between said respective ends of said respectively connected panel sections; and

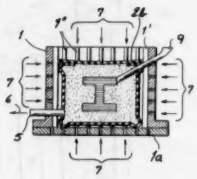
substantially flexible welding curtain means positioned between said horizontal and vertical tubular frame means so as to be generally framed by said horizontal and vertical frame means, thereby providing a protective shield for said welding work location.

4,085,790

CASTING METHOD USING CAVITYLESS MOLD

Adalbert Wittmoser, Lampertheim, Germany, assignor to Grunzweig & Hartmann und Glasfaser AG, Ludwigshafen, Germany

Filed Apr. 30, 1976, Ser. No. 682,037
Claims priority, application Germany, May 2, 1975, 2519463
Int. Cl.² B22C 15/20, 9/04
U.S. Cl. 164—7 **2 Claims**



1. A method of casting a metallic article, comprising the steps of:

providing a cavityless mold bounded by flexible membranes on at least one pair of opposite sides as well as on its top and bottom;

filling said mold with a free-flowing mass of refractory particles;

imbedding in said mass a pattern of vaporizable material conforming to the shape of the article to be cast;

compacting said mass from said opposite sides and from said top and bottom between said membranes by simultaneously exerting upon said membranes an external fluid pressure exceeding the internal pressure of said mold; and

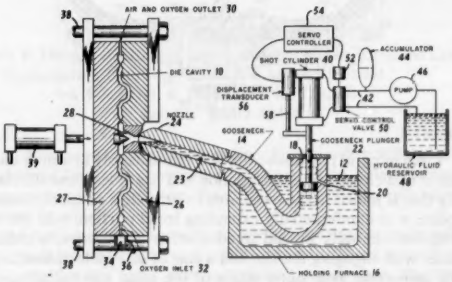
introducing molten metal into said mold in the presence of said fluid pressure for vaporizing said pattern while forming the desired article in its place.

4,085,791

METHOD OF PORE-FREE DIE CASTING

Willard D. Kaiser, Grove City, Ohio, assignor to International Lead Zinc Research Organization, Inc., New York, N.Y.

Filed Jan. 26, 1976, Ser. No. 652,121
Int. Cl.² B22D 27/20, 17/04
U.S. Cl. 164—55 **6 Claims**



1. A method of reducing the pores formed in a material cast in a die cavity by the hot chamber process including a goose-

neck and nozzle combination for filling the die cavity, the method comprising the steps of:

substantially displacing non-reactive gas from the gooseneck and nozzle combination with the material by filling at least a portion of the gooseneck and nozzle combination to a predetermined level with the material;

maintaining the material in the gooseneck and nozzle combination at said predetermined level while purging the die cavity with a reactive gas and thereafter until the die cavity is to be filled with the material; and

filling the die cavity with the material through the gooseneck and nozzle combination whereby substantially no non-reactive gas is forced into the die cavity by the material as the material fills the die cavity, the reactive gas reacting with the material in the die cavity to form a solid compound therewith rather than the pores which non-reactive gas would have formed in the cast material.

4,085,792

METHOD OF CASTING LEAD ALLOY AUTOMOTIVE BATTERY PARTS

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 618,772, Oct. 2, 1975, Pat. No. 3,980,126, which is a continuation-in-part of Ser. No. 432,545, Jan. 11, 1974, Pat. No. 3,954,216, which is a continuation-in-part of Ser. No. 395,528, Sep. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,388, Sep. 28, 1971, abandoned. This application Feb. 19, 1976, Ser. No. 659,572

Int. Cl.[2] B22C *3/00*

U.S. Cl. 164—72 **9 Claims**

(a) PROVIDING A GRID MOLD HAVING A MOLD SUBSTRATE CONSISTING ESSENTIALLY OF ALUMINUM;
(b) HARD SURFACE ANODIZING AT LEAST A PORTION OF SAID MOLD SUBSTRATE TO PRODUCE MOLDING SURFACE THEREON; AND
(c) SUCCESSIVELY PERFORMING STEPS (i), (ii), AND (iii) TO FORM SAID BATTERY GRIDS, WHICH STEPS COMPRISE:
(i) INTRODUCING MOLTEN LEAD ALLOY INTO SAID MOLD AGAINST SAID INSULATING MOLDING SURFACE;
(ii) ALLOWING SAID LEAD ALLOY TO COOL TO FORM A STORAGE BATTERY GRID; AND
(iii) REMOVING SAID GRID FROM SAID MOLD.

1. A method of producing a storage battery grid of uniform thickness comprising the steps of:

(a) providing a grid mold having a mold substrate consisting essentially of aluminum and defining a grid mold cavity comprising a shallow lattice of thin grid strut mold voids having dimensions larger than those of the grid to be cast therein;

(b) hard surface anodizing at least a portion of said mold substrate to produce an insulating molding surface thereon and to reduce the dimension of said grid mold cavity to the desired grid dimensions to be cast therein;

(c) introducing molten lead alloy into said grid mold cavity against said insulating molding surface, said molding surface allowing said molten lead alloy to flow into and fill all of the interstices of said mold; and

(d) allowing said lead alloy to cool to produce a dimensionally uniform storage battery grid comprising a lattice of thin lead struts.

4,085,793

PLATE MOULD HAVING TWO TILTABLY ADJUSTABLE END WALLS

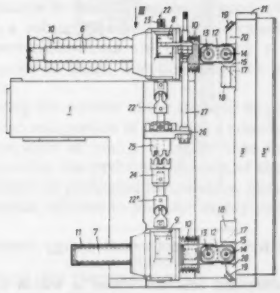
Alois Scheinecker, Linz; Karl Koller, St. Polten, and Günter Holleis, Linz, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Nov. 15, 1976, Ser. No. 741,548

Claims priority, application Austria, Nov. 24, 1975, 8908/75

Int. Cl.[2] B22D *11/00, 11/124*

U.S. Cl. 164—436 **6 Claims**



1. In a plate mould, having two tiltably adjustable end walls and two broad-side walls to give the plate mould a rectangular cross-section, for continuously casting steel slabs, and two adjustment drives hinged to opposed end portions of each one of said said two end walls, the improvement which comprises a pair of parallel link plates hinged to a respective one of said two adjustment drives as well as to a respective end wall, to connect each one of said end walls with a two adjustment drives engaging thereat in a four-bar-linkage manner.

4,085,794

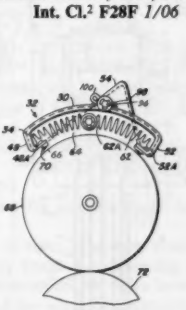
METHOD AND APPARATUS FOR FUSER ASSEMBLY COOLING IN AN ELECTROSTATOGRAPHIC MACHINE

Karl Mueller, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 214,305, Dec. 30, 1971, Pat. No. 3,993,124. This application Jun. 16, 1976, Ser. No. 696,469

Int. Cl.[2] F28F *1/06*

U.S. Cl. 165—1 **3 Claims**



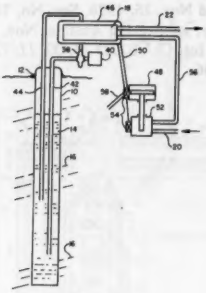
1. A two roller fuser assembly having cooperating pressure and fusing rollers, the improvement comprising heat transfer means for selectively cooling an end portion of at least one of said pressure and fusing rollers.

4,085,795

METHOD FOR USING GEOTHERMAL ENERGY

George Herbert Gill, 1817 W. 21st St., Joplin, Mo. 64801

Filed May 10, 1976, Ser. No. 684,611
Int. Cl.[2] F28D *15/00*; B01J *8/00*
U.S. Cl. 165—45 2 Claims



1. A method for using geothermal energy cmprising the steps of;

immersing a chemical reaction vessel in which a chemical reaction which requires heat is to occur in a geothermal fluid having temperatures sufficient to maintain said chemical reaction;

wherein the step of immersing comprises surrounding said chemical reaction vessel by a jacket and pumping said geothermal fluid through said jacket around said chemical reaction vessel;

inputting the chemical reactants necessary for said chemical reaction to said chemical reaction vessel;

pressurizing said chemical reactants from the natural pressure of said geothermal fluid; and

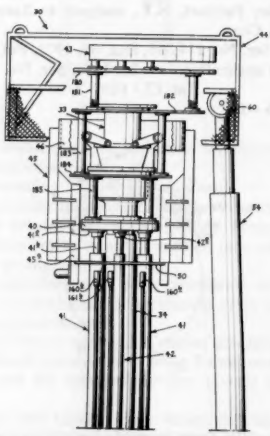
discharging the end product of said chemical reaction from said chemical reaction vessel into a storage container.

4,085,796

WELL TUBING HANDLING SYSTEM

Malcolm N. Council, Richardson, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Nov. 16, 1976, Ser. No. 742,331
Int. Cl.[2] E21B *33/03*
U.S. Cl. 166—77.5 19 Claims



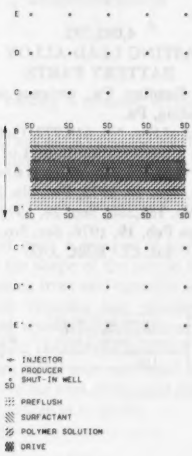
1. A well tubing handling system comprising: stationary gripping means for holding an elongated member being inserted into or removed from a well bore; traveling gripping means axially aligned with said stationary gripping means for engaging and moving an elongated member into and out of a well bore; power means for driving said traveling gripping means toward and away from a well bore including a plurality of hydraulic cylinder-piston units having substantially equal effective operating strokes and different effective cross-sectional working areas; and means for selectively directing hydraulic fluid to one or a combination of said hydraulic units for varying the lifting and snubbing capacity and speeds of movement of said traveling gripping means.

4,085,797

PROGRESSIVE DISPLACEMENT OF RESIDUAL WATER PAST SHUT-IN WELLS PREPARATORY TO TERTIARY OIL RECOVERY

Joseph C. Trantham, Bartlesville, Okla., and Robert F. Meldau, Santa Maria, Calif., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 22, 1976, Ser. No. 752,951
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—245 10 Claims



1. A method comprising:

injecting a preflush fluid through at least one injection well into an underground formation in an oil field having a plurality of wells around said injection well, which oil field has been subjected to a water flood recovery operation;

producing formation fluid from at least one production well spaced apart from said injection well by at least one shut in well located between said at least one injection well and said at least one production well;

thereafter injecting a chemical fluid through said at least one injection well;

thereafter injecting drive fluid through said at least one injection well;

keeping said at least one shut in well shut in until said preflush fluid reaches said at least one shut in well;

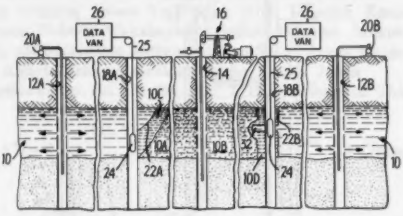
thereafter opening said at least one shut in well and recovering oil therefrom; and

after oil between said at least one injection well and said thus opened at least one shut in well has been essentially depleted, converting said thus opened well to a new preflush injection well, shutting in said at least one injection well and repeating the above steps at wells spaced further apart from said at least one injection well.

4,085,798
METHOD FOR INVESTIGATING THE FRONT PROFILE DURING FLOODING OF FORMATIONS

Jeffrey S. Schweitzer, Ridgefield, and Ralph M. Tapphorn, Danbury, both of Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 15, 1976, Ser. No. 750,846
Int. Cl.[2] E21B *47/00*; G01V *5/00*; G01T *1/00*
U.S. Cl. 166—252 26 Claims



1. A method of investigating in situ the profile of a flood front in an oil-bearing earth formation as it progresses through the formation towards a producing well communicating with the formation from a plurality of injection wells traversing the formation and spaced about the periphery of the producing well, comprising the steps of:

adding a tracer element to the flood fluid injected through each injection well, each tracer element having a characteristic gamma ray emission energy which differs from that of the other tracer element or elements, at least one of the tracer elements being a normally stable element which emits gamma rays at said characteristic energy when irradiated with nuclear radiation;

irradiating the formation at each of a plurality of observation boreholes with said nuclear radiation to induce the emission by said tracer element of gamma rays at said characteristic energy, said observation boreholes being located intermediate said injection wells and said producing well;

detecting gamma rays emanating from the formation at each of said plurality of observation boreholes located intermediate to said injection wells and said producing well; and

obtaining, by spectral analysis of the detected gamma rays, an indication of the presence of said tracer elements for use in determining the time of arrival at said observation boreholes of the flood fluids from the respective injection wells.

4,085,799
OIL RECOVERY PROCESS BY IN SITU EMULSIFICATION

Issam S. Boussaid; Alfred Brown, and Thomas W. Norman, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 18, 1976, Ser. No. 742,922
Int. Cl.[2] E21B *43/22, 43/24*
U.S. Cl. 166—272 24 Claims

1. A method for recovering oil from a subterranean, oil containing, permeable formation penetrated by at least one injection well and by at least one spaced apart prodution well, both wells being in fluid communication with the formation, comprising:

(a) injecting into the formation via the injection well an organic liquid which is liquid at formation conditions, having dispersed therein alkali metal particles, the size of the alkali metal particles being less than the size of the major flow channels of the formation; and

(b) injecting water into the formation to displace the organic liquid alkali metal dispersion through the formation to react with water in the formation forming alkali metal hydroxide, hydrogen and generating heat; and

(c) recovering oil displaced by the fluids of steps (a) and (b) from the formation via the production well.

4,085,800
PLUGGING EARTH STRATA

Charles J. Engle, and John H. Runnels, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 7, 1976, Ser. No. 748,336
Int. Cl.[2] E21B *43/24, 33/138*
U.S. Cl. 166—288 11 Claims

9. A process for stimulating the oil production of permeable strata in a subterranean oil-bearing formation whereby the highly permeable strata are plugged by a surfactant-steam mixture prior to steam injection in which the improvement comprises:

preheating the portion of the strata to be plugged by injecting into said portion of the strata a noncondensible gas, the temperature of which is higher than that of the strata, then, while the preheated portion of the strata is at substantially its preheated temperature, injecting the surfactant-steam mixture to plug the highly permeable strata.

4,085,801
CONTROL OF INCOMPETENT FORMATIONS WITH THICKENED ACID-SETTABLE RESIN COMPOSITIONS

Thomas R. Sifferman, and Derry D. Sparlin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Nov. 5, 1976, Ser. No. 739,216
Int. Cl.[2] E21B *33/138*
U.S. Cl. 166—295 17 Claims

1. In a method for controlling an incompetent formation comprising:

(a) admixing to form a mixture consisting essentially of an acid-settable liquid thermosetting resin, a substantially neutral hydrocarbon oil, and an oil soluble acidic catalyst; and

(b) positioning the mixture in contact with the incompetent formation; the improvement comprising:

incorporating in the mixture of (a) sufficient of a quaternary ammonium salt of cellulose sulfate, a quaternary group of said quaternary salt of cellulose sulfate containing at least 16 carbon atoms, to produce a minimum apparent viscosity in the mixture positioned in contact with the incompetent formation of at least 50 cps, but less than 5000 cps at the temperature and pressure prior to positioning and an apparent minimum viscosity at conditions in the locus of the incompetent formation of at least 25 cps.

4,085,802
USE OF THICKENED OIL FOR SAND CONTROL PROCESSES

Thomas R. Sifferman, and Derry D. Sparlin, both of Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Filed Jan. 17, 1977, Ser. No. 760,251
Int. Cl.[2] E21B *33/138*
U.S. Cl. 166—295 19 Claims

1. In a method for controlling an incompetent formation comprising:

(a) admixing to form a mixture consisting essentially of a base-settable liquid thermosetting resin, a substantially neutral hydrocarbon oil, and a basic catalyst; and

(b) positioning the mixture in contact with the incompetent formation;

the improvement comprising:

incorporating in the mixture of (a) sufficient of a carboxy vinyl polymer, a neutralizing agent therefor, and a miscible polar solvent therefor to produce a minimum apparent viscosity in the mixture positioned in contact with the

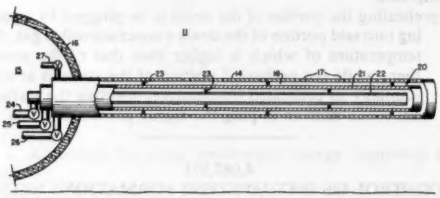
incompetent formation of at least 50 cps, but less than 5000 cps at the temperature and pressure prior to positioning and an apparent minimum viscosity at conditions in the locus of the incompetent formation of at least 25 cps.

4,085,803

METHOD FOR OIL RECOVERY USING A HORIZONTAL WELL WITH INDIRECT HEATING

Roger Moore Butler, Calgary, Canada, assignor to Exxon Production Research Company, Houston, Tex.

Filed Mar. 14, 1977, Ser. No. 777,293
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—303 **16 Claims**



16. In a method for recovering viscous hydrocarbons from a subterranean formation comprising

positioning a perforated conduit substantially horizontally into said formation;

disposing in said conduit a heating means to heat fluids in said conduit;

injecting a fluid into the formation through said perforated conduit;

permitting fluids including the formation hydrocarbons to flow into said conduit;

heating said fluid in said conduit with said heating means to a temperature such that at least a portion of the drained fluid passes into said formation; and

recovering formation hydrocarbons from the formation through said conduit.

4,085,804

WELL TUBING ANCHOR WITH AUTOMATIC SLIP RELEASE

John S. Page, Jr., 10424 Echo River Ct., Fountain Valley, Calif. 92708

Continuation-in-part of Ser. No. 595,561, Jul. 14, 1975, Pat. No. 3,977,473. This application Aug. 30, 1976, Ser. No. 718,916
Int. Cl.[2] E21B *23/04, 40/00*
U.S. Cl. 166—315 **14 Claims**

1. In apparatus to anchor well tubing to well casing,

a. an upright tubular body connectible in series with a well tubing string, there being a wedge surface on the body and tapering axially,

b. slip means movable axially relative to the body and positioned to be urged relatively radially outwardly toward the casing by the wedge surface,

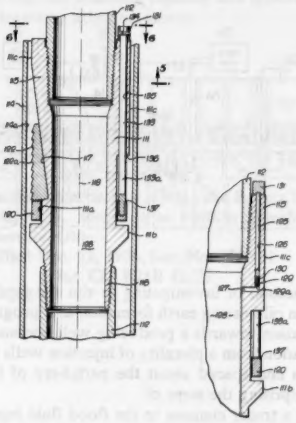
c. piston means carried for axial movement relative to the body, and having piston surface extent exposed to well fluid pressure acting to urge the piston means, and slip means axially as aforesaid, and

d. delay means on the body acting to block said movement of the slip means relative to the body while well fluid pressure exerted on said piston surface extent remains below a predetermined level, and to unblock said relative movement when the well fluid pressure reaches said level whereby the pressure is then operable to effect axial movement of the slip means,

e. there being structure including a rod extending axially of the body to transmit force from the piston means to the slip means.

11. The method of anchoring a pipe string to casing in a well and at an anchor location deep in the well, the anchor including slip means, that includes the steps,

a. allowing fluid to rise in the pipe string above said location and allowing the string to correspondingly elongate downwardly in the well, and



b. utilizing the static pressure of the rising fluid to cause the slip means to move upwardly, for anchoring the string to the casing at said location subsequent to said elongation, thereby to block the string against downward movement only, but allowing the string to move up in the well,

c. producing upward flow of well fluid, while the string is anchored, and

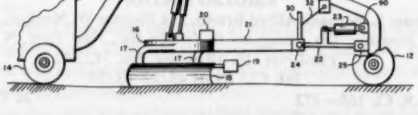
d. maintaining the annulus about the anchor open while said upward production flow is continued.

4,085,805

EARTH WORKING MACHINE WITH ELEVATION CONTROL FOR TOOL THEREOF

Royal R. Hawkins, Bloomington, Minn., and Leland E. Kuntz, Arlington Heights, Ill., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 26, 1976, Ser. No. 652,010
Int. Cl.[2] E02F *3/76*
U.S. Cl. 172—4.5 **11 Claims**



1. In an earth working machine having a main frame and a support assembly for supporting an earth working tool to the main frame, a control system for controlling the horizontal orientation of the support assembly comprising:

a cam surface and cam sensor means adapted to be mounted between the main frame and the support assembly, said cam sensor means having a cam follower for following said cam surface to provide a control signal dependent upon deviations of said support assembly from a prescribed horizontal orientation, said cam surface contoured to predetermine the horizontal orientation of said support assembly; and,

control means connected to said cam sensor means by a

circuit means, said control means receiving said control signal through said circuit means to produce an output therefor proportional to said control signal to control the horizontal orientation of the support assembly.

4,085,806

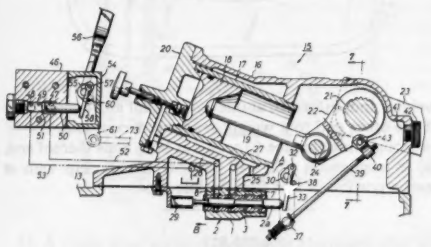
HYDRAULIC CONTROL SYSTEM FOR TRACTOR

Masahide Osujyo; Isamu Yamanishi; Akio Inamori; Kaoru Fujikawa; Noboru Wakabayashi; Seiichi Ikegami; Makoto Okada, and Morimitsu Katayama, all of Sakai, Japan, assignors to Kubota Tekko Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 555,296, Mar. 4, 1975, abandoned. This application Jan. 5, 1977, Ser. No. 757,010

Int. Cl.[2] A01B *63/112*

U.S. Cl. 172—9 **4 Claims**



1. A hydraulic control system for a tractor, comprising hydraulic means for raising and lowering a working implement mounted on the frame of the tractor, a position control valve for controlling the operation of the hydraulic means, a first manual manipulating means, said means for manipulating the position control valve, means for operating the position control valve operable by said first manipulating means, a hitch mounted on the tractor frame to mount the working implement and having a draft force sensing member, a draft control valve, a second manual manipulating means, said means for manipulating the draft control valve, means for operating the draft control valve operable by the said second manual manipulating means, draft feed back means interconnecting the operating means and the draft force sensing member, the manual manipulating means for the position control valve and for the draft control valve being independently operable such that movement of one manipulating means cause no movement of the other manipulating means and being separately provided with, respectively, a bypass communicating with a tank and located in an intermediate portion of an oil passage extending from the position control valve to the hydraulic means for applying oil pressure to the piston of the hydraulic means, the position control valve and the draft control valve being separate from and independent of each other, the draft valve being disposed in the bypass, the draft control valve being operable to completely shut off inflow of working oil into the bypass to thereby render the system operable solely for position control when the draft control valve manual manipulating means is shifted to its raised position, the draft control valve being operable to control return flow of oil to the tank through the bypass in response to variations in draft force when the position control valve manual manipulating means is in its raised position, permitting pressure to act on the piston of the hydraulic means, so that upon a decrease in draft resistance the throttling degree of the draft control valve for the bypass decreases, increasing the return flow of oil to the tank and thereby reducing the pressure on the piston, while upon an increase in draft resistance the throttling degree increases, reducing the return flow of oil to the tank and thereby increasing the pressure on the piston.

4,085,807

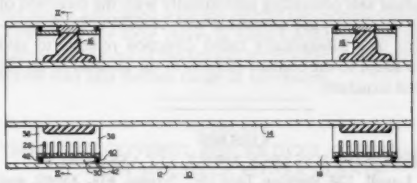
GAS-INSULATED TRANSMISSION LINE WITH CLOSED PARTICLE TRAP

Philip C. Bolin, Westborough, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 16, 1977, Ser. No. 797,097

Int. Cl.[2] H01B *9/04*

U.S. Cl. 174—14 R **10 Claims**



1. A gas-insulated transmission line comprising:

an elongated outer sheath;

an elongated inner conductor disposed within said outer sheath;

an insulating gas disposed within said outer sheath and electrically insulating said inner conductor from said outer sheath;

means for insulatably supporting said inner conductor within said outer sheath;

an apertured trapping member disposed within, and electrically connected to, said outer sheath, said trapping member being spaced-apart from said outer sheath at least at some portion thereof and forming a low field region therebetween for the entrapment of particles therein, said trapping member having first and second longitudinal end portions; and

first means connected to said trapping member first end portion and said outer sheath for prohibiting the movement of particles from said low field region to outwardly longitudinally beyond said first end portion.

4,085,808

SELF-DRIVING AND SELF-LOCKING DEVICE FOR TRAVERSING CHANNELS AND ELONGATED STRUCTURES

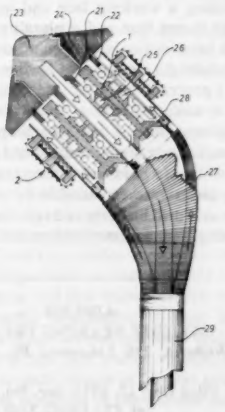
Miguel Kling, Seestrasse 38, 8131 Berg, Germany

Filed Jan. 28, 1977, Ser. No. 763,671

Claims priority, application Germany, Feb. 3, 1976, 2604063

Int. Cl.[2] E21C *7/00*

U.S. Cl. 175—94 **32 Claims**



1. A self-driving and self-locking device for traversing the

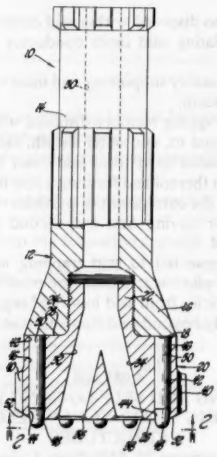
inner walls of channels enclosed on all sides, or for traversing the outer casing of structures with a substantially constant cross-section over their lengths, and for affixing itself thereon, comprising a frame, propulsive elements disposed on said frame and individual drive means for each of said propulsive elements to produce movement in the desired direction of movement of said device, said propulsive elements being distributed about the outer or inner circumference relative to a longitudinal axis coinciding substantially with the direction of forward movement and adjustable with respect to the longitudinal axis in a substantially radial direction relative to said frame to adapt to the contact surfaces in the channel or on the elongated structure.

4,085,809

RECONDITIONABLE DRILL BIT ASSEMBLY

Robert Lovell, 224 Burning Tree Dr., Naples, Fla. 33940, and John K. Stott, 16 Glen Edyth Place, Toronto, Canada

Filed Jan. 10, 1977, Ser. No. 757,928
Int. Cl.² E21C *13/00*
U.S. Cl. 175—410 **4 Claims**



1. A reconditionable drill bit assembly comprising: a drill bit body including means at one end for attaching the assembly to a drill string and a thrust face at the opposite end and a head section separably connected to said drill bit body; said head section including a working face and an opposite rear face engaging said thrust face and a plurality of bores extending through said head section and opening on said working face, said bores including a tapered seat portion adjacent said working face and a generally cylindrical section extending from said seat portion to said rear face, a tapered carbide cutting insert seated in said seat portion and a back-up pin located in said cylindrical section engaging the inner end of said cutting insert and said thrust face to hold said cutting insert in place whereby said cutting inserts are replaceable by separating said head section from said drill bit body and removing said back-up pins and said cutting inserts through said cylindrical sections of said bores.

4,085,810

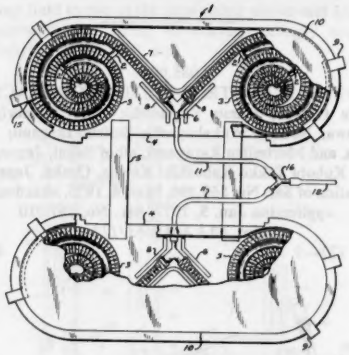
WEIGHT BEARING TREADLE

Lester R. Wellman, 110 Lakewood Pl., Highland Park, Ill. 60035

Filed Dec. 13, 1976, Ser. No. 749,773
Int. Cl.² G01G *5/04*
U.S. Cl. 177—209 **10 Claims**

1. A weight-bearing treadle having at least one substantially rigid horizontal plate and comprising, in cooperative relationship:

(a) a reinforced, first flexible tube (i) disposed upon said horizontal plate and adapted to react compressively to a



weight, and, (ii) sealed at one end thereof and connectable at the other end to a weight-read-out means; and,

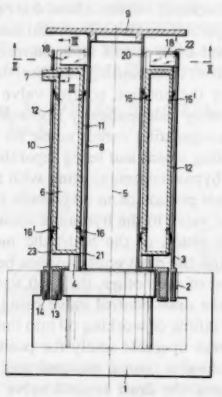
(b) a second flexible tube (i) sealed at both ends thereof and, (ii) in contiguous side-wall support relationship with at least a portion of said first flexible tube.

4,085,811

ELECTROMAGNETICALLY COMPENSATING BEAMLESS DYNAMOMETER OR WEIGHING DEVICE

Knothe, Erich, Eddigehausen; Christoph Berg, and Eberhard Stadler, both of Goettingen, all of Germany, assignors to Sartorius-Werke GmbH und. vorm. Goettinger Praezisionswaagenfabrik GmbH, Goettingen, Germany

Filed Aug. 3, 1976, Ser. No. 711,368
Claims priority, application Germany, Aug. 11, 1975, 2535758
Int. Cl.² G01G *21/10, 7/00*
U.S. Cl. 177—210 EM **19 Claims**



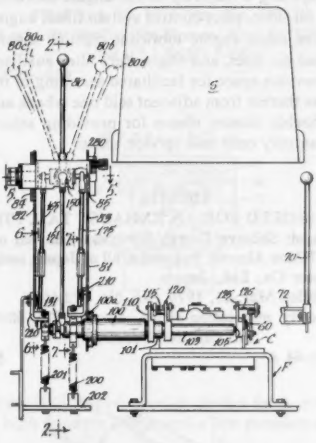
1. An electromagnetically-compensating beamless dynamometer or weighing device which comprises a fixed magnet, a working gap provided by said magnet, a coil movable within said working gap, and an arrangement for guiding movement of said movable coil relative to said fixed magnet, said guiding arrangement comprising a fixed guiding cylinder and an air-mounted slidable sleeve connected to said coil, said cylinder and sleeve forming an air bearing, and wherein the slidable sleeve has a transverse element which rests, substantially without friction in a recess in the guiding cylinder.

4,085,812

ACTUATOR SYSTEM FOR DUAL PATH TRANSMISSION

William J. Robinson, and Harold G. Martin, both of Ames, Iowa, assignors to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 24, 1976, Ser. No. 744,937
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 **23 Claims**



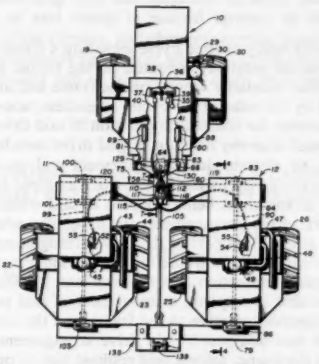
21. A single lever actuator system for speed and steer control of a vehicle such as a crawler tractor or the like having a pair of independent hydrostatic transmission units including at least one variable displacement power unit having a displacement control responsive to a hydraulic control pressure, a control console having a ratio valve and a pair of steer valves mountable on the vehicle and in hydraulic communication with said variable displacement means for the hydrostatic power units, a control station at a location remote from the control console and having a manually operable control lever movable about one axis for setting a uniform speed as well as forward or reverse travel direction for the transmission units and movable about another axis for establishing a turn for the vehicle, three separate motion-transmitting linkages each having a part operatively connected to the control lever and associated one with each of the ratio valve and the pair of steer valves, said motion-transmitting linkages including a series of coaxial rotatable shafts of different lengths extending adjacent the control console and with each shaft having an output arm with there being two shafts and output arms connected one to each of the steer valves and a third shaft and output arm connected to the ratio valve, each of said rotatable coaxial shafts extending to different positions underlying the control station and having an input arm whereby motion applied to an input arm results in rotation of an associated output arm by rotation of the interconnecting rotatable coaxial shaft, a first rod extended between the control lever and an input arm which operates the ratio valve whereby movement of the control lever about said one axis results in movement of the ratio valve to establish a control pressure and a direction of travel for the vehicle, the motion-transmitting linkages for the steer control valves each having a rod extended between the control lever and an associated input arm of said rotatable coaxial shafts; said input arms for the steer control valves being urged by yieldable urging means to a null position against an adjustable stop and with movement of the control lever in one direction about said other axis causing the associated rod to move the associated input arm away from its adjustable stop and against the force of said yieldable urging means; each of the rods of the motion-transmitting linkages for the steer control valves being of a two-part construction with a loose coupling therebetween and having a first part connected to the control lever whereby only one of the rods is operative in one direction of movement of the control lever about the other axis to urge an input arm away from its adjustable stop while the other rod has its first part moving without affecting its associated input arm because of the loose coupling, said control lever in moving about said other axis having a first range of movement in one direction to move a steer valve an amount sufficient to reduce the speed of an associated transmission unit to zero and having a further range of movement for operation of a steer valve to cause the associated transmission unit to operate in the opposite direction and means associated with the rods of the motion-transmitting linkages for the steer valves to impart additional resistance to manual movement of the control lever when said control lever moves into said further range of movement.

4,085,813

THROTTLE CONTROL FOR ARTICULATED TRACTOR WITH MULTIPLE POWER PLANTS

Jerauld D. Joubert, Longmont, Colo., assignor to Steiger Tractor Inc., Fargo, N. Dak.

Filed Nov. 30, 1976, Ser. No. 746,154
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—14 A **8 Claims**



1. A throttle control system for an articulated tractor comprising first, second and third tractor vehicles, each having a rotatable axle, a pair of ground engaging driving elements coupled to said axle adjacent opposite ends thereof, and an engine drivingly connected to said axle to drive said driving elements, said first tractor vehicle also having an operator's compartment, each of said engines having a throttle positioner for adjustably positioning the throttle of the engine for varying the power output thereof,

coupling means for pivotally securing said second and third tractor vehicles to the rear of said first tractor vehicle for pivotal movement with respect to said first vehicle about a generally vertical axis,

a throttle control in the operator's compartment of said first tractor vehicle, means operatively connecting said throttle control to the throttle positioners of each of said vehicles for simultaneous adjustment of each of said throttle positioners in the same power changing direction upon movement of said throttle control,

steering means including a steering control in the operator's compartment of said first tractor vehicle for changing the angular relationship of said second and third tractor vehicles with respect to said first tractor vehicle to temporarily cause an angular relationship to exist between the longitudinal axes of said second and third vehicles and the longitudinal axis of said first tractor vehicle, and

means responsive to such change in angular relationship to affect the relative positions of the throttle positioners of said second and third vehicles so that the engine of the vehicle on the inside of the turn tends to operate at a lower

speed than the engine of the vehicle on the outside of the turn.

4,085,814

MOTORIZED BICYCLE

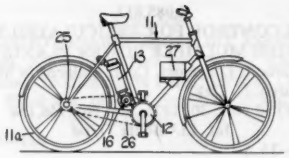
Charles Patrick Duncan Davidson, Droitwich, and Harry Simister Bottoms, Solihull, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Jun. 18, 1976, Ser. No. 697,279

Claims priority, application United Kingdom, Jun. 21, 1975, 26449/75

Int. Cl.[2] B62M *7/00*

U.S. Cl. 180—33 C **4 Claims**



1. An electrically assisted cycle including a frame, a ground engaging wheel rotatably mounted on the frame, a rotatable drive member rotatably wound on the frame and arranged to be rotated by the rider of the cycle, an endless, non-extensible flexible member for transmitting motion of said drive member to said wheel whereby rotation of said drive member propels the cycle, an electric drive arrangement and an associated power source carried by the frame, a drive output of the electric drive arrangement being coupled to said wheel whereby said electric drive arrangement can drive the wheel means mounting at least that part of the drive arrangement carrying the drive output on the frame for limited movement relative thereto against the action of a resilient bias, electrical switch means operable in response to movement of said part of said drive arrangement relative to the frame, and the arrangement being such that said part of said drive arrangement is moved relative to the frame, against said resilient bias to operate said switch by the application to said drive member, by the rider of driving force to propel the cycle, said switch means in use being so associated with the electric drive arrangement that the electric drive arrangement cannot be energised unless said switch means is operated.

4,085,815

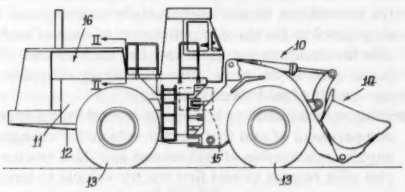
VEHICLE COMPONENT ASSEMBLY

Lindell L. Miller, Plano, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 674,783

Int. Cl.[2] B60R *27/00*; B62D *25/00*

U.S. Cl. 180—54 R **3 Claims**



1. In a vehicle having a frame, wheels carrying said frame, an engine carried by said frame between a pair of said wheels, a transmission, an engine lubricating system, a plurality of auxiliary structures including an engine lubricant filter, a pilot control system filter, a filler tube having an inlet for delivering lubricant to the lubricating system, and a dipstick having a manipulating portion for indicating the quantity of lubricant in the lubricating system, an air filter for cleaning air to be delivered to the engine, and an engine fuel filter, the improvement comprising: enclosure means above said engine and defining a service space having a side opening, said side opening being disposed to open horizontally to above one of said wheels; means for disposing a majority of the engine lubricant filter, transmission oil filter, pilot control system filter, engine lubricant filler tube inlet, engine lubricant dipstick manipulating portion, engine air filter, and engine fuel filter auxiliary structures in said service space for facilitated servicing of the auxiliary structures therein from adjacent said one wheel; and selectively positionable closure means for providing selective access to substantially only said service space.

4,085,816

HEAT SHIELD FOR AN EXHAUST TAIL PIPE

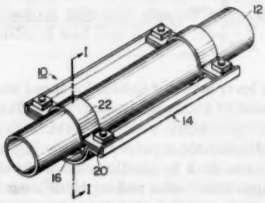
Susumu Amagai; Shizuya Kawai; Hiroyasu Kan, all of Yokohama, and Hideo Aizawa, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed Mar. 31, 1976, Ser. No. 672,464

Claims priority, application Japan, Apr. 4, 1975, 50/40921

Int. Cl.[2] B60K *13/04*

U.S. Cl. 180—64 A **5 Claims**



1. For use in a motor vehicle having an internal combustion engine and a body which is spaced from a road surface on which said vehicle stands, a combination comprising:

a cylindrical exhaust tube mounted in use beneath a body of a vehicle to allow the exhaust gases from an internal combustion engine to pass therethrough;

a rectangular heat shielding plate of lesser axial length than said tube provided with a longitudinally extending concave recess having at opposite lateral sides of said concave recess respective step portions extending along the length of the concave recess, the concave recess having a semicircular cross section the radius of which is larger than that of an outer cylindrical surface of said exhaust tube;

at least two axially spaced bridge members each having longitudinal ends respectively connected to said step portions and a middle portion transversely spanning said concave recess, said middle portion being bent toward a bottom of said concave recess to form a round section on which said exhaust tube is disposed in frictional contact therewith, the radius of said round section being smaller than that of said concave recess thereby to define a semicylindrical space between a surface of said heat shielding plate, defining said concave recess and an outer surface of said bridge member whereby a certain semicylindrical air space is defined between said surface of said concave recess and an outer surface of said exhaust tube; and

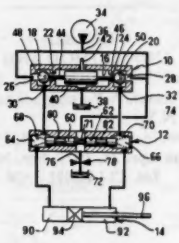
at least two axially spaced bracket members each having longitudinal ends respectively connected to said step portions of said heat shielding plate and a middle portion covering said exhaust tube and in frictional contact therewith to attach said heat shielding plate to said exhaust tube in such a manner that the bottom of said concave recess is located between said exhaust tube and a road surface when said heat shielding plate is mounted on said exhaust

tube and such that said heat shielding plate may move axially relative to said tube.

4,085,817
POWER STEERING DEVICE

Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Aug. 23, 1976, Ser. No. 717,051
Claims priority, application France, Aug. 21, 1975, 75 25864
Int. Cl.[2] B62D 5/08
U.S. Cl. 180—132 7 Claims



1. A hydraulic power steering device for a motor vehicle having a high pressure source and a low pressure source comprising:

a distribution valve communicating with the high pressure source;

a hydraulic assisting motor having a piston which substantially defines a first chamber and a second chamber which communicate with said distribution valve such that movement of said distribution valve increases the pressure in one of said first and second chambers and decreases the pressure in the other of said first and second chambers;

a by-pass passage communicating the high pressure source with the low pressure source; and

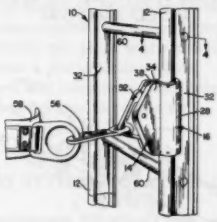
means intersecting said by-pass passage, said means being responsive to a pressure differential between the first and second chambers of said hydraulic assisting motor to move relative to the by-pass passage and to control the flow of fluid through said by-pass passage, said means defining a first cross-section area which normally restricts the flow of fluid through said by-pass passage and a second cross-section area which restricts the flow of fluid through said by-pass passage when said means moves in response to the pressure differential between the first and second chambers to dispose the second cross-section area within said by-pass passage, and said means further including a surface for interrupting the flow of fluid through said by-pass passage when said by-pass passage intersects said means between the first cross-section area and the second cross-section area.

4,085,818
PLASTIC LADDER AND SAFETY DEVICE

William E. Swager, P.O. Box 656, Fremont, Ind. 46737

Filed May 20, 1976, Ser. No. 688,145
Int. Cl.[2] E06C 5/36, 7/08
U.S. Cl. 182—47 13 Claims

1. In combination, a step-ladder having an elongated fiber reinforced plastic rail having a clamp sliding surface shaped to receive a safety clamp, a web extending from and supporting said sliding surface and a base supporting said web and said surface providing clear and free sliding support of said clamp on said surface, a safety clamp sized and shaped to surround and to engage and slide on said rail, said safety clamp having a clamping portion comprising a wide smooth cam-shaped surface evenly bearing in its width against the correspondingly shaped and smooth sliding surface of said rail, said cam surface being alternately positioned to slide easily with said clamp or to bear against and firmly grip the surface of said plastic rail frictionally in a position of clamped engagement therewith, a trigger arm extending from said clamping portion engageable by a rope or chain carried by a climber for easy pull on said trigger arm and clamp to slide said clamp upward or downward on said rail in ascending or descending movement of said climber on said ladder, means above said cam surface biasing

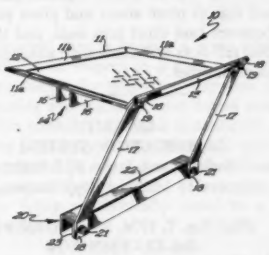


said clamping portion into a clamping engagement of said rail, said pull offsetting said bias sufficient to allow easy sliding movement of said clamp in normal upward or downward movement of the climber, said clamping portion being actuated into firmly clamped engagement with the surface of said rail by rapid downward pull of said rope or chain upon said trigger arm.

4,085,819
PLATFORM ATTACHMENT FOR A LADDER

Rudy Ohnstad, 9010 Old Highway 8, New Brighton, Minn. 55112

Filed May 6, 1977, Ser. No. 794,543
Int. Cl.[2] E06C 7/16
U.S. Cl. 182—121 1 Claim



1. A platform attachment for a ladder comprising:

a substantially flat, generally rectangularly shaped platform having substantially straight longitudinal and transverse edges, the longitudinal and transverse edge portion of said platform being bent upwardly, one of said longitudinal edge portions being bent upwardly at a greater degree than the remaining longitudinal and transverse edge portions to define a lip,

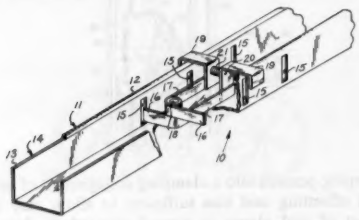
a first elongate channel member including a web portion secured to the lower surface of said platform, and including a pair of legs integral with and depending from said web portion, said channel member having a length corresponding to and extending substantially the width of said platform,

a pair of generally vertically oriented elongate substantially flat stages each having angularly offset end portion of each strap being secured to the lip of said platform,

a second elongate channel member corresponding in size to said first channel member and including a web portion and a pair of legs integral with and depending from said web portion, the other end of each of said straps being secured

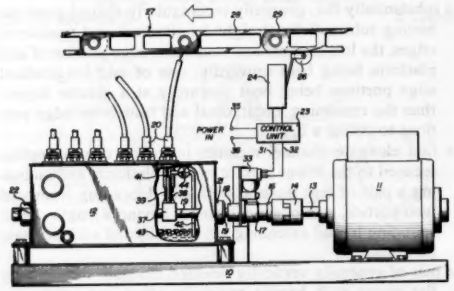
to one leg of said channel member whereby when said first channel member engages one rung of the ladder, the second channel member will engage the next adjacent lower rung to position platform in horizontal relation.

4,085,820
LADDER LEVELER
Louis F. Cerny, 2594 Chase St., Denver, Colo. 80214
Filed Jul. 5, 1977, Ser. No. 813,163
Int. Cl.[2] E06C *7/44*
U.S. Cl. 182—204 **2 Claims**



1. A ladder leveler, comprising in combination, a latch mechanism, an inner rail and an outer rail, said rails each being of U-shaped transverse configuration, said inner rail being slidably fitted inside said outer rail, a plurality of equally spaced apart slots along opposite side walls of each said rail, a longitudinal edges of said outer rail being rolled around longitudinal edges of said inner rail; said mechanism comprising a pair of L-shaped arms, an inside corner of each said arm being around a side of a pivot-pin, a short leg of each said arm extending generally in opposite directions, while a long leg of said arms extend generally parallel to each other, a U-shaped member being affixed to an end of said long leg of each said arm, a compression coil spring between said members, whereby squeezing said members together cause the ends of said arm short legs to pivot about said pivot pin so to shorten a distance between said short arm ends, and thus be released from said outer rail slots and allow slide adjustment of said rails respective to each other.

4,085,821
LUBRICATION SYSTEM
Philip J. Kast, Madison, and James F. Schmitt, Marshall, both of Wis., assignors to Madison-Kipp Corporation, Madison, Wis.
Filed Sep. 7, 1976, Ser. No. 720,816
Int. Cl.[2] F16N *7/24*
U.S. Cl. 184—15 A **5 Claims**



1. A lubricating system for delivering a clean shot of a fluid lubricant to a selected point on a moving conveyor or the like, said system comprising:

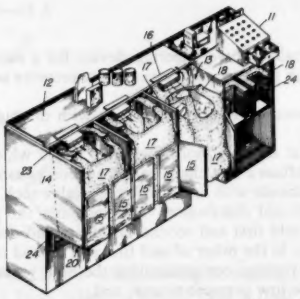
a positive displacement metering piston pump actuated by a rotatable shaft, said pump being adapted to deliver a predetermined volume of lubricant on each revolution of said shaft;

a single revolution clutch having a driven end and a driving end, said driven end being operatively connected to said shaft of said pump;

an electric motor operatively connected to the driving end of said clutch; and

a control system for actuating said clutch to couple said motor to said pump for a single revolution of said shaft when said conveyor has arrived at a predetermined location, whereby said pump delivers a clean shot to a predetermined section of said conveyor.

4,085,822
BAG ASSEMBLY AND METHOD AND APPARATUS FOR LOADING INDIVIDUAL BAGS
Paul V. Osborn, Webster, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Continuation of Ser. No. 637,801, Dec. 4, 1975, abandoned. This application Apr. 21, 1977, Ser. No. 789,381
Int. Cl.[2] E04H *3/04*
U.S. Cl. 186—1 A **1 Claim**



1. An apparatus to facilitate the bagging of articles comprising a check-out counter having a section with a flat top where articles are placed, a bag stack comprising a plurality of open mouth thermoplastic bags each of said bags having integral handles on opposite sides of the open mouth portion of said bags, said bag being suspended from a location adjacent to and below the top of said counter; a pneumatic device comprising a blower and air plenum chamber provided with an air outlet above and adjacent said open mouth portion of said bags to provide a steady stream of air into the mouth of the outermost of said bags, to open said bag and to maintain said bag in an open position while it is being loaded with said articles; said individual loaded bag being removed from said bag pack by grasping said handles of said loaded bag and positioning said loaded bag at a point removed from said section; said apparatus being further characterized by having a bag support surface which is located adjacent to and slightly above the bottom of said bag stack whereby when individual bags are inflated thereby causing the individual bag bottom to rise slightly when said bag is in an inflated condition said bag bottom will be supported on the said support surface.

4,085,823
ELEVATOR SYSTEM
William R. Caputo, Wyckoff, and John J. De Lorenzi, Manalapan, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 3, 1975, Ser. No. 628,448
Int. Cl.[2] B66B *5/02*
U.S. Cl. 187—29 R **31 Claims**

1. An elevator system, comprising:

a structure,

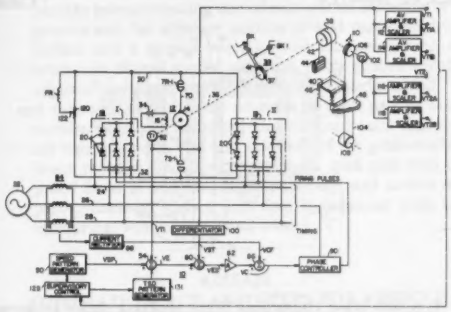
an elevator car mounted for movement in said structure,

motive means including motor means for effecting movement of said elevator car,

control means for operating said motive means, including means providing a speed pattern signal having a magnitude responsive to the desired speed of the elevator car,

means providing a first speed signal having a magnitude responsive to said motor means,

means responsive to said speed pattern signal for providing a response signal indicative of the expected response of the elevator car to the speed pattern signal,



comparator means comparing said first speed signal and said response signal, said comparator means providing a predetermined output signal when the compared signals differ by a predetermined magnitude,

and modifying means for modifying the operation of the elevator car in response to the comparator means providing said predetermined output signal when the elevator car is moving.

4,085,824

WARNING DEVICE FOR FRICTION PAD IN DISK BRAKE

Yoshihisa Nomura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyotashi, Japan

Filed Dec. 21, 1976, Ser. No. 752,863

Claims priority, application Japan, Dec. 29, 1975, 50-176522[U]; Dec. 29, 1975, 50-176523[U]

Int. Cl.² F16D *66/02*

U.S. Cl. 188—1 A **4 Claims**

1. A warning device for a friction pad in a disk brake of a vehicle which includes a brake disk, and a pair of friction means which are disposed on the opposite sides of said brake disk and slidable towards said brake disk so as to hold said brake disk therebetween for frictional engagement, said friction means each consisting of a friction pad and a shoe holding said pad, said device comprising:

a resonant member comprising a flat shaped dust cover secured to a body of the vehicle in the vicinity of said brake disk in a manner that said dust cover surrounds said brake disk for protecting said brake disk from mud and dust;

a contacting piece being secured to said resonant member and extending towards one of the side surfaces of said brake disk;

an arm portion being formed on said shoe in one of said friction means and being capable of pressing and contacting piece towards one of the side surfaces of said brake disk when said friction means slides towards said brake disk; and

a plurality of serrations or projecting portions being provided in part of the surface of said brake disk and extending in the radial direction and being arranged in the circumferential direction of said brake disk, said projecting portions being capable of contacting said contacting piece so as to vibrate said piece when said friction pad is worn down beyond a predetermined limit;

the vibration of said contacting piece being amplified by said resonant member due to resonance.

4,085,825

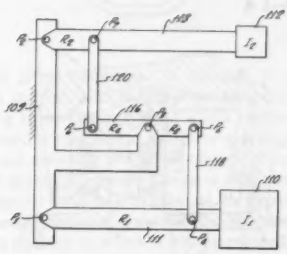
VIBRATORY SYSTEM ISOLATION AND FLEXURE PIVOT

William M. Scarborough, Whittier, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 3, 1975, Ser. No. 564,950

Int. Cl.² F16F *7/10*

U.S. Cl. 188—1 B **9 Claims**



1. In a gyroscopic device having a gyro body assembly vibratably rotated with respect to a gyro case, the improvement comprising means for providing vibration isolation between said assembly and said case, said means comprising

a mass member rotatably mounted to said case, and

rigid coupling means interconnecting said gyro body and said mass member for counter-rotating said mass member in synchronism with said body,

said assembly being mechanically tuned to a preselected resonant frequency.

4,085,826

BRAKE WEAR INDICATOR

Irving Ray Ritsema, and John Lewallen Turak, both of South Bend, Ind., assignors to The Bendix Corporation, South Bend, Ind.

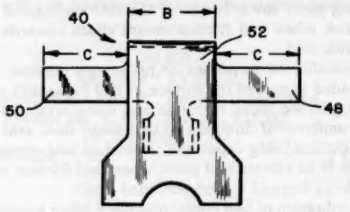
Filed Dec. 13, 1976, Ser. No. 750,105

Int. Cl.² F16D *66/02*

U.S. Cl. 188—1 A **1 Claim**

1. In a disc brake having a rotor secured to a rotating portion of an axle housing, a torque member secured to a non-rotating portion of the axle housing and a caliper slidably mounted on the torque member, said caliper cooperating with a pair of friction elements to urge the friction elements into engagement with the rotor, the improvement wherein a brake wear indicator attaches to one of said friction elements, said brake wear indicator comprising a generally U-shaped spring clip defining two substantially parallel legs, one of said legs being secured to said one friction element and the other of said legs having a prong extending therefrom which is engageable with the rotor when said one friction element is worn to a predetermined dimension, said other leg also having a flange extending from

said U-shaped spring clip in a direction normal to the prong, said flange being free to vibrate when said prong is engageable with said rotor to generate an audible signal, and said prong



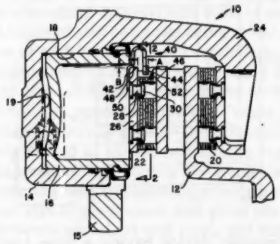
comprising a pair of prongs extending normal to said other leg and said flange comprising a pair of flanges extending from each side of said other leg.

4,085,827

DISC BRAKE WEAR INDICATOR

William J. Kestermeier, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Oct. 22, 1976, Ser. No. 734,907
Int. Cl.² F16D *66/02*
U.S. Cl. 188—1 A **1 Claim**



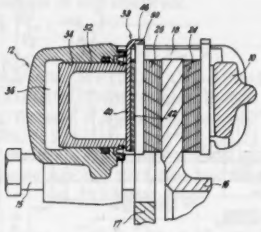
1. In a disc brake having a pair of friction elements that are enageable with a disc during braking, a backing plate supporting one of the pair of friction elements and being movable with the one friction element when the latter is urged into engagement with the disc, and a brake wear indicator attached to the backing plate for providing a warning when the one friction element is worn to a predetermined dimension, the improvement in which said brake wear indicator comprises a U-shaped spring clip which extends from an attachment on one side of the backing plate to the other side, said one friction element having a recess for receiving a portion of said U-shaped spring clip which extends on the other side of the backing plate and said U-shaped spring clip terminating at the portion in a pair of axially outwardly extending prongs which are engageable with the portion of the disc that is engageable with the one friction element when the latter is worn to a predetermined dimension, said backing plate being engageable with a piston cup which moves the backing plate and one friction element toward the disc during braking, said U-shaped spring clip extending radially outwardly past the piston cup around the outer edge of the backing plate between the attachment with the backing plate and the axially outwardly extending prongs, said prongs and attachment being disposed on opposite sides of the backing plate at substantially the same radial position, said U-shaped spring clip including a bend adjacent the connection to the backing plate to remain spaced from the piston cup when the piston cup is engaging the backing plate, and said U-shaped spring clip including at least one recess adjacent the attachment with said backing plate to avoid interfering with the means for supporting the one friction element to the backing plate.

4,085,828

DISC BRAKE AND HEAT SHIELD FOR THE SAME

Alain Thioux, Chennevieres, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Feb. 25, 1977, Ser. No. 772,042
Claims priority, application France, Mar. 16, 1976, 76 07459
Int. Cl.² F16D *65/84*
U.S. Cl. 188—71.6 **7 Claims**



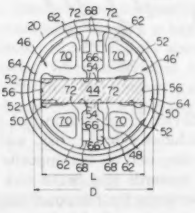
1. A disc brake comprising brake applying means cooperating with a caliper so as to urge two friction pads toward respective faces of a rotary disc, said brake applying means comprising at least one piston mounted in a cylinder and capable of moving toward the disc from an idle position so as to urge one of the pads toward a corresponding face of the disc upon operation of the brake, a detachable heat shield between said piston and said one pad, the shield having at least one layer of thermal insulation, said caliper including an aperture defining two circumferentially spaced edges, each edge defining at least one sliding surface with which the pad cooperates according to the wear on its lining, at least one of said edges also including a recess offset toward the piston relative to the corresponding sliding surface, the dimensions of the recess permitting radial extraction of the pad through the aperture in the absence of the heat shield when the piston is in its idle position and preventing this extraction in the presence of the heat shield.

4,085,829

DISC BRAKE

Kazuaki Shimizu, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Japan

Filed Dec. 15, 1976, Ser. No. 750,673
Claims priority, application Japan, Dec. 19, 1975, 50-151291
Int. Cl.² F16D *55/228*
U.S. Cl. 188—72.5 **6 Claims**



1. A disc brake comprising:
directly and indirectly operated pads;
a yoke;
an actuator operative between said directly operated pad and said yoke, said actuator including a movable component having a blind bore with a cylindrical wall;
said yoke having a tongue projecting into said blind bore,

said tongue having a rectangular cross section and having two opposed faces;

a pair of insert members of a resilient material in said blind bore between said tongue and said cylindrical wall;

said pair of insert members having grooves, respectively, which receive said tongue, each groove having two spaced sidewalls and a bottom wall interconnecting said sidewalls,

each pair of insert members having a generally cylindrical outer surface engaging said cylindrical wall, a first brace portion interconnecting one of said spaced sidewalls of its groove and the adjacent portion of said part cylindrical surface and a second brace portion interconnecting the other one of said spaced sidewalls of its groove and the adjacent portion of said part cylindrical surface, and

said first and second brace portions of each pair of insert members being constructed and disposed such that they are compressed to bias said sidewalls of the groove of the insert member into firm engagement with said two opposed faces of said tongue, respectively, and to bias said part cylindrical surface into firm engagement with said cylindrical wall of said blind bore.

4,085,830

AUTOMATIC SLACK ADJUSTERS FOR VEHICLE BRAKES

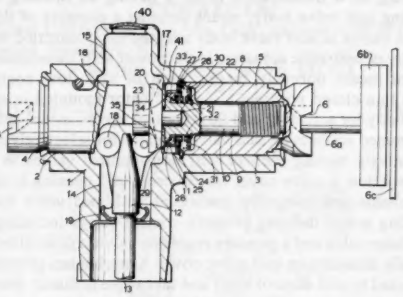
Harry Simister Bottoms, Solihull, and John Richard Archer, Wantage, both of England, assignors to Girling Limited, Birmingham, England

Filed Sep. 24, 1976, Ser. No. 726,119

Claims priority, application United Kingdom, Oct. 3, 1975, 40452/75

Int. Cl.[2] F16D *65/56*

U.S. Cl. 188—196 D **6 Claims**



1. An automatic slack adjuster for a vehicle brake, comprising a strut assembly including at least two parts, a driven ring surrounding one of said parts, adjusting means for controlling the effective length of said strut assembly, said adjusting means comprising an adjuster member acting on said one part through said driven ring, clutch faces provided on said driven ring and said one part, overload spring means urging said clutch faces into engagement so that a reaction between said clutch faces is produced and said driven ring and said part are movable together unless a reaction between said clutch faces exceeds the reaction produced by the loading of said overload spring, means allowing said driven ring to rotate relative to said strut assembly when the reaction exceeds the loading of said spring so as to preclude adjustment at this point, and locking means for locking said adjuster member against movement with said strut assembly in a brake releasing direction beyond a distance necessary to establish a desired braking clearance between a braking member and a rotatable braking surface in said brake, said adjuster member comprising a drive ring which surrounds said driven ring, teeth being provided in the inner peripheral edge of said drive ring, complementary teeth being provided in the outer peripheral edge of said driven ring, said teeth meshing with a degree of lost-motion corresponding to said desired braking clearance.

4,085,831

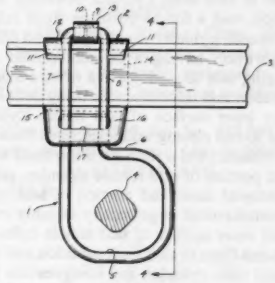
ROD GUARD FOR BOTTOM BRAKE ROD

Herschell H. Hartzell, and Norbert F. Mullaney, both of Milwaukee, Wis., assignors to A. O. Smith Corporation, Milwaukee, Wis.

Filed Apr. 11, 1977, Ser. No. 786,344

Int. Cl.[2] B61H *13/34*

U.S. Cl. 188—210 **5 Claims**



1. A rod guard adapted to be attached to a brake beam member to prevent a loose, disconnected bottom brake rod from falling from a railway car, which comprises a looped hanger formed with a loop at the lower end portion to receive the brake rod assembly and terminating in a pair of horizontally space upwardly extending arms in turn terminating in an inwardly turned horizontal member at the upper end, a clamp having a configuration to be assembled over and encircle the brake beam member to which it is to be secured, with a lower portion disposed to project forwardly of the beam with which it is assembled and having an opening therein, a center tab extending from the upper surface of the clamp and disposed to receive the inwardly turned member of the arms of the hooped hanger and to be reversely bent over the inwardly turned member to secure the looped hanger to the clamp, and end tabs secured to the clamp at either side of the center tab and disposed to be bent over the brake beam member to secure the clamp and the assembled rod guard to the brake beam member.

4,085,832

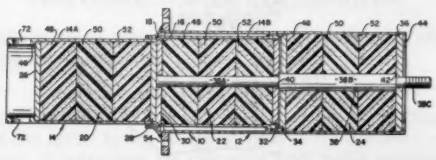
MULTI-CHAMBERED FOAM ENERGY ABSORBER

Donald Raymond Gaines, Farmington, Mich., and Bronco Felex Jelenic, deceased, late of Ann Arbor, Mich. (by Ronald B. Jelenic, administrator), assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Continuation-in-part of Ser. No. 577,277, May 14, 1975, abandoned. This application Jan. 18, 1977, Ser. No. 760,268

Int. Cl.[2] F16F *9/30*

U.S. Cl. 188—268 **6 Claims**



1. A shock absorber comprising a pair of telescoped male and female cylinders each having an outer end portion and a telescoped inner end portion; a rod within and coaxial with

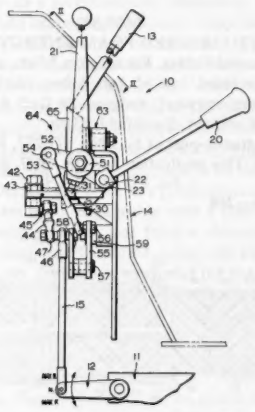
said cylinders, said rod being fixed relative to said female cylinder; each of said cylinders having an inner surface; a first chamber in the outer end portion of said male cylinder, a second chamber within the telescoped inner end portion of said male cylinder, a third chamber in the outer end portion of said female cylinder; said first chamber being defined by a first axial portion of the inner surface of said male cylinder, a first partition affixed to and closing the outer end of said male cylinder, and a second partition disposed slidably within said male cylinder, said second partition being fixed relative to said rod and said female cylinder and having a circumferential edge axially slidably engaging said first portion of said inner surface of said male cylinder; said second chamber being defined by a second axial portion of the inner surface of said male cylinder, a third partition fixed in said male cylinder inwardly adjacent said second partition, and a fourth partition fixed relative to said rod and said female cylinder inwardly of said third partition, said fourth partition having a circumferential edge axially slidably engaging said second portion of said inner surface of said male cylinder; said third chamber being defined by an axial portion of the inner surface of said female cylinder, a fifth partition fixed to and closing said telescoped inner end portion of said male cylinder, and a sixth partition fixed to and closing said outer end portion of said female cylinder, said fifth partition and telescoped inner end portion of said male cylinder having a circumferential edge axially slidably engaging said portion of said inner surface of said female cylinder; said rod having a first end fixed to said sixth partition and a second end disposed in said male cylinder, and compressible foamed plastic material filling each said first, second and third chambers radially to the corresponding inner surface portion of said cylinders defining said chambers and axially between the corresponding partitions of said chambers, inward movement of said male cylinder relative to said female cylinder simultaneously displacing said first, third and fifth partitions respectively toward said second, fourth and sixth partitions, whereby all said material in said first chamber is axially compressed between said first and second partitions, all said material in said second chamber is axially compressed between said third and fourth partitions and all said material in said third chamber is axially compressed between said fifth and sixth partitions.

4,085,833

HYDROSTATIC TRANSMISSION CONTROL

Stamos I. Papasideris, Bristol, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 27, 1976, Ser. No. 754,296
Int. Cl.[2] B60K *41/26*; G05G *11/00, 5/08*
U.S. Cl. 192—4 B **16 Claims**



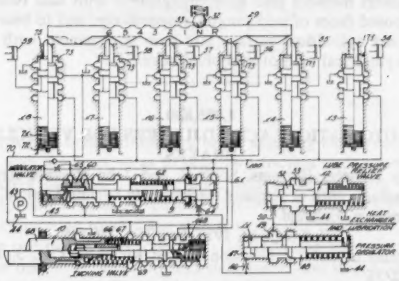
1. In a vehicle drive having speed control means including a movable control element for causing the speed of the drive to vary in accordance with the positioning of said control element, and a manually operable speed lever, the improvement comprising: a manually operable range selector lever; connecting means interconnecting said speed lever and said control element for moving said control element as a function of movement of said speed lever; and adjusting means connected to said range selector lever for causing the amount of movement of said control element resulting from a movement of said speed lever to be any one of a plurality of preselected amounts.

4,085,834

VALVE ASSEMBLY FOR POWER SHIFT TRANSMISSION

Ernest A. Kreitzberg, Mukwonago, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 2, 1976, Ser. No. 710,907
Int. Cl.[2] F16D *25/10*
U.S. Cl. 192—87.13 **10 Claims**



1. A valve assembly for a power shift transmission comprising, a valve body, means adapting said valve assembly for mounting on a transmission housing having an opening for receiving said valve body, means defining a plurality of flow control valves in said valve body adapted for connection to a plurality of hydraulic actuators in the power shift transmission, resilient means normally biasing each of said flow control valves to a closed position, a valve actuator mounted in said valve body for actuating said flow control valves, means defining cammed surfaces on said valve actuator for selectively and alternatively biasing each of said flow control valves to an open position, a valve cover for covering said opening in said transmission and integrally connected with said valve body including means defining pressure control valves including a modulator valve and a pressure regulator valve, a control lever pivotally mounted on said valve cover, a mechanism pivotally connected to said control lever and said valve actuator, detent means selectively positioning said valve actuator in a selected one of a plurality of positions, inlet passage means adapted for connecting to a pump, connecting passage means connecting said inlet passage means to said pressure regulator valve for regulating pressure from said pump in said inlet passage means, said connecting passages connecting said inlet passage to said modulator valve, and flow control passage means connecting said modulator valve to said flow control valves for supplying modulated pressurized fluid through said flow control valves to the hydraulic actuators in the power shift transmission.

4,085,835

LIQUID COOLED CLUTCHES

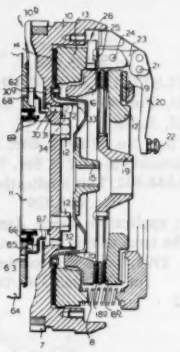
Richard John Bailey, Sheffield, England, assignor to GKN Transmissions Limited, Birmingham, England

Filed Jul. 22, 1976, Ser. No. 707,671
Claims priority, application United Kingdom, Jul. 28, 1975, 31471/75; Jul. 8, 1976, 28385/76; Jul. 8, 1976, 28386/76
Int. Cl.[2] F16D *13/72*
U.S. Cl. 192—113 AB **8 Claims**

1. A clutch assembly comprising a housing, driving and driven plates disposed within said housing and arranged to be

relatively movable between engaged and disengaged positions, a mechanism for effecting such relative movement, and means for establishing circulation of a liquid through the clutch assembly, said means comprising:

a chamber on the housing, said chamber having an open mouth facing generally tangentially in opposition to the



direction of rotation of the driving plate, whereby in use liquid impelled by rotation of the driving plate is caught by the chamber and some part at least of the kinetic energy of such liquid is converted into a static pressure head,

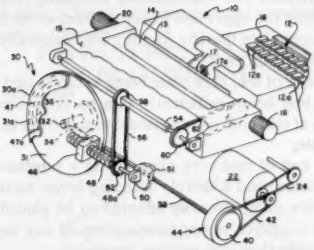
duct means extending from said chamber for carrying liquid therefrom to a required place in the clutch assembly under the influence of said static pressure head.

4,085,836

ROTARY MAGNETIC STORAGE MEDIUM FOR TYPEWRITERS

Michael J. Markakis, Palo Alto, Calif., assignor to SCM Corporation, New York, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,632
Int. Cl.[2] B41J *5/30*
U.S. Cl. 197—19 **14 Claims**



1. In combination with a typewriter having a keyboard and print members together with a platen for holding and feeding a printing medium to produce printed copy, and including a manually operable key for controlling line feed of the platen:

an indexless magnetic storage medium mounted on said typewriter for rotational movement through plural revolutions,

means defining a large number of spaced storage tracks adjacent one another on said storage medium,

a single transducer effective to enter characters into and read characters from said tracks during the rotational movement of the storage medium,

means mounting said transducer on the typewriter in operative relation to the storage medium,

means for moving said transducer from one storage track to an adjacent track in cooperation with said track-defining means and only in response to line feed of said printing medium,

means operable independently of the rotational orientation of said storage medium and responsive to actuation of the line feed key during a recording operation for recording a variably-located preamble signal and a postamble signal relative to the characters entered in said storage medium, and

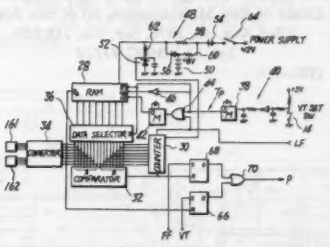
means responsive to receiving the postamble signal during replay operation for actuating line feed of the printing medium.

4,085,837

VERTICAL TABULATION CONTROL FOR HIGH SPEED PRINTER

Rikuo Takano, Musashino; Yutaka Ohta, Kodaira; Yuji Sumitomo, Nara; Yoichi Shimazawa, Yamatokoriyama, and Masahiko Aiba, Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation and Sharp Kabushiki Kaisha, both of, Japan

Filed May 6, 1976, Ser. No. 683,960
Claims priority, application Japan, May 8, 1975, 50-55694
Int. Cl.[2] B41J *15/00*
U.S. Cl. 197—133 R **11 Claims**



1. A vertical tabulation control circuit for a high speed printer in which vertical tabulation is achieved by a predetermined number of line feed operations, comprising:

a presettable memory for storing vertical tabulation addresses;

a counter for counting the number of line feed operations;

means for developing a continous line feed termination command when the contents of the counter reach a preset vertical tabulation address;

a power supply;

a power switch for activating said printer by selective interconnection thereof to said power supply; and

a rechargeable battery means interconnected with said power switch, said presettable memory and said counter, which is charged from said power supply when the high speed printer is activated through said power switch, said rechargeable battery means supplying said presettable memory and said counter with a necessary voltage for maintaining their contents when the power supply to said printer through said power switch is terminated.

4,085,838

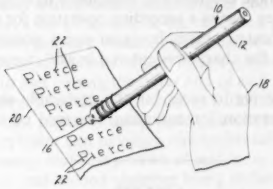
TYPE CORRECTION ARTICLE EMPLOYING ADHESIVES

James N. Pierce, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 14, 1974, Ser. No. 451,111
Int. Cl.[2] B41J *29/16*
U.S. Cl. 197—181 **10 Claims**

1. An article having particular utility in the corrective removal of typewritten ink characters from typing substrates such as paper, said characters being of the type characterized by greater internal cohesion than external adhesion to said substrates, said article comprising

(a) at least one discriminating adhesive portion comprising a fused blend of 30 to 55 parts by weight vinyl resin and 70 to 45 parts by weight compatible plasticizer, said portion



defining a deformable resilient projection, the surface of said projection having a discriminating affinity for typewriter ink, and

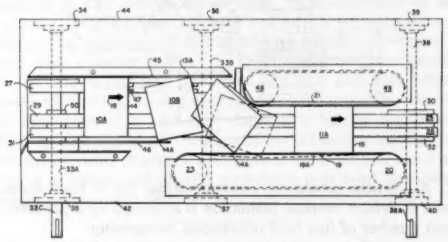
(b) means by which said article can be gripped.

4,085,839

APPARATUS FOR CONVEYING AND TURNING ARTICLES

Lynn D. Crawford, San Jose, Calif., assignor to Genevieve I. Hanscom, Robert M. Magnuson & Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson, all of San Jose, Calif.

Filed Aug. 30, 1976, Ser. No. 719,059
Int. Cl.[2] B65G *47/24*
U.S. Cl. 198—410 **6 Claims**



1. Apparatus for conveying and rotating a train of articles comprising, in combination:

a horizontal platform conveyor for carrying each article forward along a predetermined path;

a bumper positioned in the path of said article to contact a forward corner thereof adjacent a first side of the conveyor to initiate rotation of said article by slowing forward movement of the contacted corner;

a first side facing belt extending on the second side of said conveyor and supported about pulleys driveably rotated about axes extending upward from the plane of the conveyor, said first side facing belt being positioned to contact and guide the side of said article opposite the bumper for continuing the pivoting of the article about the bumper in a controlled manner;

first and second fenders on the first and second sides of said conveyor respectively, said fenders being spaced apart a distance slightly greater than the width of the article as it passes therebetween along the conveyor;

said platform-type conveyor including first and second power driven horizontal belts adjacent said first and second fenders respectively and having a horizontal surface for carrying said articles along said predetermined path;

means for driving said second horizontal belt at a speed greater than that of the first belt so as to initiate rotation of the article prior to contact with the bumper; and

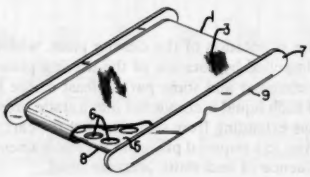
said first and second fenders being spaced apart a sufficient distance so as to limit rotation of the article due to the differential speeds between the first and second horizontal belts prior to the article coming in contact with the bumper.

4,085,840

BAKERY FLEXIBLE BELT CARRYING PLATE

Torahiko Hayashi, Post Ooffice Box 50, 2-3, Nazawa-machi Utsunomiya 320, Japan

Continuation of Ser. No. 518,951, Oct. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 213,277, Dec. 29, 1971, Pat. No. 3,844,402. This application Jun. 23, 1976, Ser. No. 698,819
Claims priority, application Japan, Jan. 14, 1971, 46-461172
The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.
Int. Cl.[2] B65G *47/00*
U.S. Cl. 198—472 **1 Claim**



1. A carrying plate assembly for semimanufactured sticky dough products, such as bread and doughnuts, comprising

a carrying plate assembly adapted to be movingly carried by moving conveyor means by placement on said moving conveyor means,;

said assembly having a substantially rectangular, flat core plate with the top and bottom surfaces of said flat core plate being substantially parallel to each other and an endless flexible belt with laterally extending ridges rotatable around the upper and lower surfaces at the front end of said core plate thereby forming a substantially pointed end at said front end;

said front end of said core plate being acute-angled and said flexible belt being sufficiently thin so as to contact the surfaces of said core plate adjacent to said front end of said core plate;

said front end of said core plate havng a substantially flat upper surface and a sharply receding lower surface;

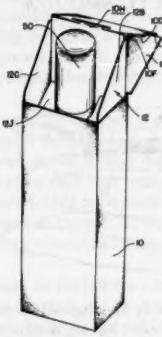
said carrying plate assembly adapted to be placed on said moving conveyor means independent of any supporting means other than said moving conveyor;

said carrying plate assembly having a bottom plate engaging said moving conveyor means;

said flexible belt adapted to be turned by frictional contact with means engaging said belt directly when said carrying plate assembly approaches a transfer station, wherein said belt turns from the upper surface to the bottom of said core plate around the front end of said core plate and said belt turns from the bottom surface to the upper surface around the rear end of said core plate;

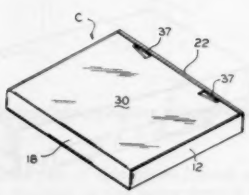
the configuration of said belt in its cross-section of laterally extending ridges being such that when said belt turns around the front end of said core plate the distance between the outward ends of any adjacent pair of ridges increases to such extent that the dough product thereon becomes separated from the ridges, thereby enabling separation of the dough product from said belt.

4,085,841
CARTON ASSEMBLY
Matsuyama, Glen, Los Angeles, Calif., assignor to Graphic Arts Packaging Corporation, Gardena, Calif.
Filed Apr. 29, 1977, Ser. No. 792,202
Int. Cl.[2] B65D *5/50*
U.S. Cl. 206—45.15 6 Claims



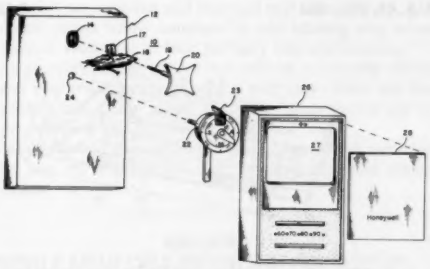
1. A carton assembly comprising: a hollow shell having a rectangular cross-section, a rectangular cover hinged by a scoreline to the rear edge of the upper end of the shell, a first flap hinged by a scoreline to the outer edge of the cover, and a second flap hinged by a scoreline to the outer edge of the first flap, the first and second flaps having a slot therein extending partially along said last-named scoreline; and a hollow insert having a rectangular cross-section slidable in said shell, said insert having a rear wall panel and further having a tab integral with the upper edge of the said insert and extending into said slot to couple the insert to the junction of the first and second flaps with the second flap being positioned against the rear wall panel of the insert and turning with respect to the first flap as the insert is moved within the shell.

4,085,842
GARMENT HANGER BOX
Robert E. Beck, Chicago, Ill., assignor to Container Corporation of America, Chicago, Ill.
Filed Jan. 10, 1977, Ser. No. 757,926
Int. Cl.[2] B65D *85/18*
U.S. Cl. 206—289 1 Claim



1. In a one piece garment container formed from a unitary blank of foldable paperboard including a pair of telescoping sections for holding at least one garment on a hanger having a hook, the combination of:
a. a generally rectangular, relatively narrow common bottom wall;
b. a pair of tray-like sections foldably joined to opposite side edges of said bottom wall and disposed for telescoping relation one within the other, each of said sections including:
i. a side wall;
ii. a pair of opposed end walls;
iii. a top wall;
iv. and said common bottom wall;
c. said side wall of at least one of said sections having a slot formed therein along the top edge thereof;
d. said top wall of at least one of said sections including:
i. a flat upper panel foldably joined at its front edge to the upper edge of said one section side wall;
ii. a relatively narrow, substantially triangularly shaped connecting panel having a straight upper edge foldably joined to one edge of said upper panel and having upwardly diverging lower edges;
iii. a lower panel having its rear edge foldably joined to the lower edges of said connecting panel and having a locking tab projecting outwardly from its front edge, and a pair of parallel slits centrally positioned in said lower panel to receive said hanger hook;
e. said locking tab being received in said slot to secure said top wall in a closed position and support the garment, whereby the crown of said hanger is located below said upper panel.

4,085,843
THERMOSTAT
John C. Espander, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Dec. 6, 1976, Ser. No. 747,834
Int. Cl.[2] B65D *85/00, 85/38*
U.S. Cl. 206—328 6 Claims

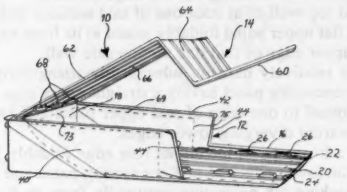


1. A thermostat, for mounting on a wall, comprising:
a base, having an aperture therein for mounting to the wall;
a temperature sensing means mounted on said base, and adapted to move with changes in temperature;
switching means mounted on said base, and adapted to operate when said temperature sensing means reaches a predetermined temperature; and
a restraining means removably attached to said switching means and adapted to restrain said switching means during said shipment of said thermostat, said restraining means being positioned in said aperture means to prevent mounting of said base to a surface without removal of said restraining means from said switching means.

4,085,844
STORAGE CONTAINER
Richard S. Dunchock, 27545 Gateway Dr., Farmington Hills, Mich. 48024
Filed May 5, 1977, Ser. No. 794,054
Int. Cl.[2] B65D *85/68*
U.S. Cl. 206—335 6 Claims

1. An automobile top storage container comprising:
a body having an upright wall contoured to receive and support the roof of an automobile top, said body having a lower inclined wall integral with said upright wall, said inclined wall being contoured to receive and support the rear window portion of said automobile top, said body having side walls extending laterally from the lower portion of said upright wall and integral with said upright wall and said inclined wall, said side walls being con-

toured to receive and support the sides of said automobile top;



a cover having a Z-shaped configuration and received by said body, said cover being contoured to support said automobile top and enclose said top in said body; and

means for releasably securing said cover to said body.

4,085,845

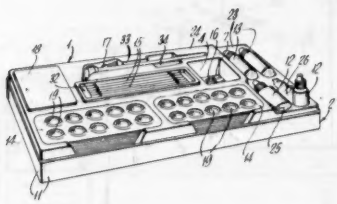
CONTAINER AND UTILITY TRAY

Alan J. Perfect, Allentown, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 15, 1975, Ser. No. 641,001

Int. Cl.[2] B65D *1/36, 85/62*

U.S. Cl. 206—564 **8 Claims**



1. A combination container and utility tray comprising

an outer container having sides and a bottom,

a tray formed of relatively thin flexible material supported by said container and secured thereto

said tray having a downwardly extending flange around the periphery thereof the width of said flange being greater than the width of the sides of said container and said downwardly extending flange contacting the sides of said container, said tray having a plurality of depressed areas formed therein for holding articles to be used,

at least one of said depressed areas being positioned near one side of said tray and having an access thereto through said downwardly extending flange the bottom of said depressed area being on the same plane as the edge of said flange and the bottom of said depressed area being secured to the bottom of said container,

and at least one of said depressed areas being in the form of a well designed for holding a vial having an upper portion and a lower portion with said well having a shallow portion and a deep portion

the shallow portion of said well having substantially the same configuration as that of the upper portion of said vial and

the deep portion of said well having substantially the same configuration as that of the lower portion of said vial

whereby the vial may be supported in a prone position in the shallow portion of said well and in

an upright position in the deep portion of said well and raised from its prone position to its upright position by pressure on the lower portion of said vial.

4,085,846

CONTAINERS ATTACHED TO PALLETS

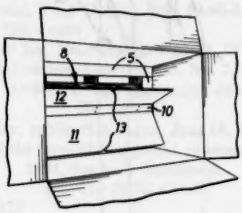
John Williams, Leamington Spa, England, assignor to South Warwickshire Packaging Services Limited, Wellesbourne, England

Filed Feb. 25, 1977, Ser. No. 772,279

Claims priority, application United Kingdom, Mar. 5, 1976, 8957/76

Int. Cl.[2] B65D *19/20*

U.S. Cl. 206—600 **3 Claims**



1. A container assembly an originally separate rigid base;

a body of container board having a substantially continuous rim extending around the lower marginal part thereof,

means defining a notch at each one of a pair of opposed locations on said rim, these two notches opening toward one another;

a floor defined by an intermediate part of container board stock secured to said base and having two opposed side edges, and a flap hingedly connected to each side edge of the intermediate part, the flaps being foldable to a first folded close together position wherein the body can be fitted on the base with each flap passing at the ends thereof through both of the notches in the rim and to a second, spread outwards position wherein the flaps, perimetrically thereof, except at said side edges trap the rim against the base thereby forming the container.

4,085,847

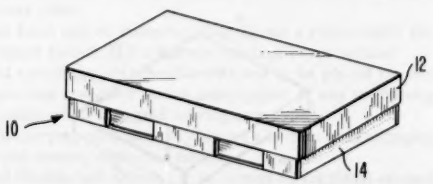
PALLET BOX PACK

Richard P. Jacalone, Owosso, Mich., assignor to Olinkraft, Inc., West Monroe, La.

Continuation-in-part of Ser. No. 744,816, Nov. 24, 1976, abandoned. This application Mar. 4, 1977, Ser. No. 774,477

Int. Cl.[2] B65D *19/20*

U.S. Cl. 206—600 **11 Claims**



1. A pallet box pack comprising

a pallet base including a base member, load carrying means, and supporting spacer means;

said base member having a rectangular bottom panel, a pair of end flaps extending upward from respective opposite ends of the bottom panel, and a pair of side flaps extending upward from respective opposite sides of the bottom panel;

said pair of side flaps of the base member each having lift arm holes formed therein adjacent the bottom panel for receiving lift arms of a fork lift truck;

said supporting spacer means supporting said load carrying means above the bottom panel within the base member

and forming passage means through the pallet base for receiving lift arms of a fork lift truck;

said flaps of the base member having upper portions extending above the load carrying means to form a shallow tray defined by the load carrying means and the upper portions of the flaps of the base member in the top of the pallet base;

a top cover fitting over the pallet base;

a collapsed tube assembly received in the shallow tray of the pallet base underneath the top cover;

said tube assembly including a pair of side wall panels, a pair of end wall panels, and four bottom flanges hinged at a common scoreline to bottom edges of the respective tube wall panels;

said tube side wall panels being connected between the opposite edges of the tube end wall panels at score lines;

said tube side wall panels further having respective reverse scorelines dividing each side wall panel into a pair of half side wall panels folded between the end wall panels;

said bottom flanges on the bottom edges of the tube side wall panels extending substantially the full lengths of the side wall panels;

said bottom flanges on the bottom edges of the tube side wall panels further having the reverse scorelines extending thereacross and being folded with the tube side wall panels; and

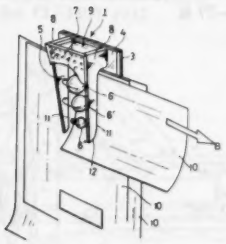
said tube assembly being adapted to be erected to form with the pallet base and the top cover a receptacle for bulk material.

4,085,848

HOLDER DEVICE FOR SUSPENDING ARTICLES SUCH AS PAPER AND THE LIKE

Kenji Tsuge, 1-3-16 Higashi Kaigan Tsujido, Fujisawa City, Japan (251)

Filed Sep. 12, 1977, Ser. No. 832,107
Claims priority, application Japan, Jan. 10, 1977, 52-753
Int. Cl.[2] A44B *21/00*; A47F *7/16*
U.S. Cl. 211—45 **10 Claims**



1. A holder device for suspending articles comprising:

a back plate,

a front plate,

a top plate and a pair of side plates joining said front and back plates together, a slot being formed between said back plate and a portion of said side plates, said front plate being inclined towards said back plate in the direction running from said top plate to form a ramp,

said top, front, back and side plates forming a receptacle,

a plurality of balls retained in the receptacle formed by said plates in a series arrangement along the ramp formed between said front and back plates, and

means for mounting said holder with said back plate running at a downward verticle angle,

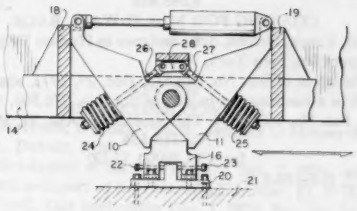
whereby when articles are inserted in said slot, they pass between said balls and said back plate and are retained by the gravity action of said balls after they are so inserted.

4,085,849

MACHINERY LOCATING DEVICE

Richard Jablin, P.O. Box 514, Winchester, Va. 22601

Filed Feb. 10, 1976, Ser. No. 656,895
Int. Cl.[2] B65G *65/50*
U.S. Cl. 214—1 BB **3 Claims**



1. A locating device for accurately moving into and maintaining in position massive traveling machinery having a normal drive comprising:

(a) at least one stop secured to a fixed structure, said stop being accurately aligned to a desired position for locating said traveling machinery;

(b) a housing mounted on said traveling machinery;

(c) power-operated clamp means for contacting and gripping said stop, to independently of said normal drive, move into and maintain in said desired position said traveling machinery and for retracting from said stop to permit said traveling machinery to move past said stop without interference between said stop and said clamp means, said clamp means being contained in said housing and, when opened, retracting at least partially into said housing;

(d) a plurality of cam rollers mounted on said clamp means and cam track means, in which said cam rollers ride for causing said clamp means to retract when opened and to project from said housing when closed; and

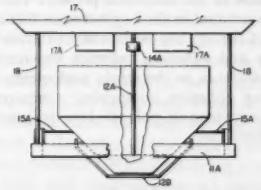
(e) power means independent of said normal drive, mounted on said traveling machinery for operating said clamp means.

4,085,850

SINGLE LOAD CELL WEIGH HOPPER SYSTEM

Carl J. Heltzel, 523 Country Club Dr. NE., Warren, Ohio 44484

Filed Dec. 13, 1976, Ser. No. 750,126
Int. Cl.[2] G01G *13/22*
U.S. Cl. 214—2 **1 Claim**



1. A weigh hopper stabilizing and weighing system comprising:

a. a weigh hopper,

b. a rigid frame about said weigh hopper,

c. a single load cell,

d. load cell support means connected to said rigid frame positioning said single load cell so that said weigh hopper bears directly thereon,

e. weigh hopper aligning rods one end of each of which is secured to said rigid frame and the other end of which engages the hopper but it is not secured thereto but are spaced about the weigh hopper for centering the weigh hopper over and upon the load cell, and

f. a bulk material bin having discharge outlet means, rigid

spacer means connected to space said rigid frame and weigh hopper below said bin discharge outlet means, said load cell support means being a spider frame having a central rod with the single load cell connected between said spider frame and the bulk bin.

4,085,851

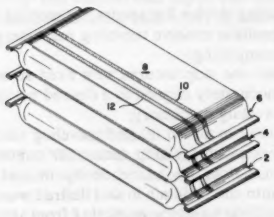
COATING FOR MULTI-WALL BAGS

Buck R. Young, Helena, Ark., assignor to Hudson Pulp & Paper Corporation, New York, N.Y.

Continuation of Ser. No. 213,513, Dec. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 776,506, Nov. 18, 1968, Pat. No. 3,642,697. This application Apr. 21, 1975, Ser. No. 569,656

Int. Cl.[2] B65D *57/00*

U.S. Cl. 214—10.5 R **4 Claims**



1. A plurality of bags filled with a product and stacked one upon another and each having first and second opposite surfaces with each said first surface being a supporting surface which is substantially co-extensive with the second surface of the next adjacent bag and said surfaces being pressed together by the weight of each upper bag pressing downwardly onto the bag beneath it, at least one of said surfaces on each of said bags having anti-slip coating means thereon for producing variable adhesion for controlling the friction between the coating means and the co-extensive surface of the next adjacent bag, said coating means comprising means for increasing adhesion and cohesion between said coating means and said next adjacent surface as the pressure to which they are subjected increases and for decreasing the cohesion and adhesion upon removal of said pressure, whereby the cohesion and adhesion between the supporting surfaces of the top two bags is minimum and the cohesion and adhesion between each other pair of co-extensive surfaces is greater than the next adjacent pair above it because of the increased pressure resulting from the weight of the product in the bag between them, and whereby the removal of the top bag in the stack produces a decrease in said cohesion and adhesion between the remaining of said co-extensive surfaces in the stack, said means for increasing and decreasing cohesion comprising a composition of low density polypropylene or polyethylene polymer, a tackifying resin and a plasticizer.

4,085,852

METHOD AND APPARATUS FOR DETERMINING THE COVERING OF A COKE WHARF WITH QUENCHED COKE

Wolfgang Teschner, Ratingen-Hosel, and Hans-Jürgen von Massow, Recklinghausen, both of Germany, assignors to Firma Carl Still Recklinghausen, Germany

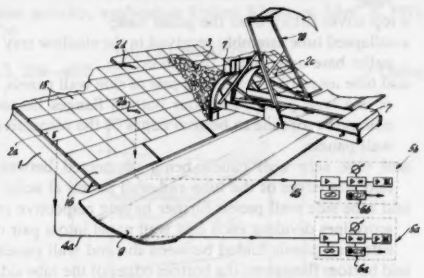
Filed Oct. 4, 1976, Ser. No. 729,020

Claims priority, application Germany, Oct. 9, 1975, 2545264

Int. Cl.[2] C10B *39/18*

U.S. Cl. 214—17 R **6 Claims**

1. A method of determining the covering of quenched coke on a coke wharf while using electric current connected to plates or strips of wear-resistant, electrically well-conducting plates which are inserted flush into the electrically poorly conducting facing of the wharf, material to an electrical potential relative to that of the surrounding facing, sensing the change of the potential of the plates as the coke is dumped on the plates and facing and as they are being cleared of the coke, and controlling subsequent moving operations in accordance with the potential change effected with the coke removal from the wharf.



5. A wharf for receiving glowing coke, comprising an inclined receiving ramp having a plurality of non-conductive areas and conductive plates interposed in said areas at spaced locations, electrical circuit control means connected to said plates and subjecting said plates to an electrical potential, said potential being variable in accordance with the coke overlying said plates, and said control means effecting a control pulse in accordance with the potential sensed.

4,085,853

CONSTRUCTION OF BUILDINGS OR PARTS THEREOF

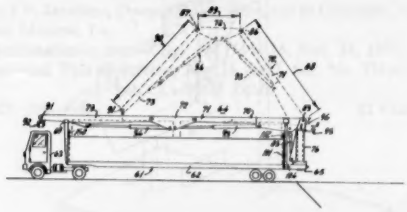
Cornelis van der Lely, 7, Bruschenrain, Zug, and Hendricus Jacobus Cornelis Nieuwenhoven, Hirssattelweg, 6340 Baar, both of Switzerland

Continuation of Ser. No. 318,244, Dec. 26, 1972, abandoned. This application Apr. 26, 1976, Ser. No. 680,383

Claims priority, application Netherlands, Dec. 27, 1971, 7117854

Int. Cl.[2] B60P *1/48*

U.S. Cl. 214—77 R **24 Claims**



1. A transport means for conveying walls, construction jigs for production of walls to building sites, said transport means comprising a load carrying portion thereof having at least one storage compartment divided into three longitudinally extending spaces adapted to carry said walls and jigs in an upright position generally parallel to the usual direction of travel of the transport means, and a discharging device located at one end of the load carrying portion of the transport means for said walls and jigs, wherein the discharging device includes a supporting member that can occupy a position in which it projects beyond the normal boundaries of the transport means as seen in plan view, said supporting member having three parts, one of said parts being a central part, hydraulic means connecting said central part to the other two said parts, said hydraulic means being all disposed on the same side of said supporting member, the discharging device also comprising coupling means for temporary connection to said walls and jigs to enable any such

temporarily connected part to be lifted vertically from the transport means by the discharging device and transferred to substantially its appointed correct position relative to the building that is being constructed, the supporting member being extensible whereby it can convey said walls and jigs to substantially any position within the area of a building site adjacent beyond the transport means from a single position, said area having a magnitude of not less than substantially one hundred square meters.

23. A tractor trailer combination for transporting mold parts for forming molds to cast at least a substantial portion of a building, which comprises a bed of said trailer, sides and forward and after walls mounted around the periphery of said trailer bed enclosing an elongated rectangular area as seen from above adapted for receiving said mold parts in an upright position disposed generally parallel to the longitudinal axis of said trailer, a discharging device mounted on the after portion of said trailer, said discharging device comprising an arm capable of projecting beyond the entire periphery of said trailer bed, said arm comprising three articulated interconnected parts and being provided with means whereby it is turnable from its after mounting about a substantially vertical axis, a first of said arm parts extending from said after mounting, a second of said arm parts extending from said first arm part, and a third arm part extending from said second arm part and having coupling means for lifting said mold parts on its opposite end, said first and third arm parts being substantially equal in length and said second arm part being substantially shorter in length than said first and third arm parts, two hydraulic mechanisms for articulating said parts relative to each other connected to said second arm part and to said first and third arm parts whereby said arm is foldable from a horizontal aligned position to an inverted V-shaped folded position in which said first and third arm parts are inclined downwardly from said second arm part which is retained in a substantially horizontal position.

4,085,854

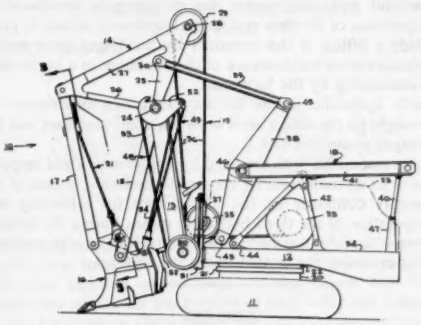
PITCH STOP ASSEMBLY FOR POWER SHOVELS

George B. Baron, Marion, Ohio, assignor to Marion Power Shovel Co., Inc., Marion, Ohio

Filed Oct. 3, 1975, Ser. No. 619,453

Int. Cl.[2] E02F 3/32

U.S. Cl. 214—138 R **30 Claims**



1. In a power shovel including a base unit; a support unit rotatably mounted on said base unit; a front end assembly including a stiffleg pivotally connected at a lower end thereof to said support unit, a dipper handle operatively connected to said stiffleg, a dipper pivotally connected to said dipper handle, a hoist frame pivotally connected to said stiff leg, and a hoist link pivotally connected at the ends thereof to said hoist frame and said dipper, said dipper handle, dipper, hoist link and hoist frame defining a four bar linkage; a crowd system operatively interconnecting said support unit and said front end assembly; a hoist system operatively interconnecting said support unit and said front end assembly; and control means mounted on said support means for operating said crowd and hoist systems to crowd, hoist, lower and retract said dipper, a pitch stop assembly comprising a flexible tension member interconnecting selected points of two different components of said four bar linkage for limiting the angular displacement of said dipper relative to said handle when said dipper is caused to pitch upwardly.

4,085,855

MECHANISM CONTROL

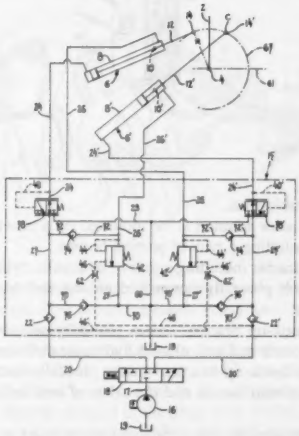
David L. Worback, Highland, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 654,675, Feb. 2, 1976, which is a continuation-in-part of Ser. No. 559,271, Mar. 17, 1975, Pat. No. 4,007,845. This application Dec. 1, 1976, Ser. No. 746,572

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.[2] E02F 3/32

U.S. Cl. 214—138 D **3 Claims**



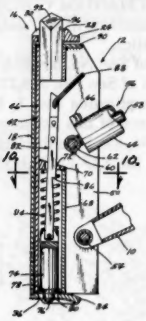
1. In a control for a swing member mounted for side-to-side singing movement having a power source, sump and power means connected with the swing member for causing the swing member to swing in opposite directions in response to flow of fluid in opposite directions to and from respective ends of the power means including at least one pair of lines for conducting fluid to and from the power means; the swing member being responsive to flow of fluid to said power means in one of said lines to swing in one direction, and responsive to flow of fluid to the power means in the other of said lines to swing in the opposite direction; a pressure reducing metering valve controlling one of said lines, said pressure reducing metering valve being operable to limit pressure to the power means through said one line to a predetermined maximum pressure upon movement of the swing member in one direction, and to meter fluid from the power means through said one line upon movement of the swing member in opposition to fluid supplied to the power means; a metering valve operable to permit flow of fluid from said power means through said other line during the swinging movement of the swing member only when a predetermined minimum pressure exists in one of said lines; and a cross line extending between said one line and the sump; the improvement comprising: a check valve in said one line located between said cross line and the power source permitting flow to one end of said power means through said one line but preventing flow from the one end of said power means through said one line.

4,085,856

QUICK ATTACH MEANS FOR END LOADERS OR THE LIKE

Neal W. Westendorf, Smithland, Iowa 51056

Filed Jan. 21, 1977, Ser. No. 761,323
Int. Cl.[2] E02F 3/81
U.S. Cl. 214—145 A 4 Claims



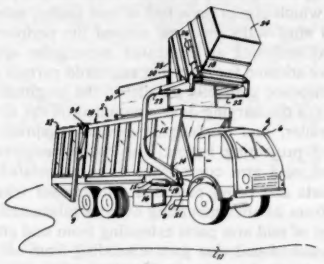
1. In combination,
an end loader adapted to be mounted on a powered vehicle and including a pair of pivotal booms,
said end loader including a pair of hydraulic cylinders which are each pivotally connected at one end to one of said booms,
a first hook-up bracket means pivotally secured to one of said booms and one of said hydraulic cylinders,
a second hook-up bracket means pivotally secured to the other of said booms and the other of said hydraulic cylinders,
an attachment having a pair of spaced-apart pocket means secured to its rearward end which are adapted to detachably receive said hook-up bracket means therein,
each of said pocket means including a channel having upper and lower ends, a top plate secured to the upper end of said channel, a bottom plate secured to the lower end of said channel,
each of said hook-up bracket means including a channel having upper and lower ends, said bracket means channel being received by said pocket means channel between said top and bottom plates,
and a locking means secured to each of said hook-up bracket means, each of said locking means including a spring-loaded plunger means which is generally vertically movable within the lateral confines of said hook-up bracket means from an unlocked position to a locked position, each of said plunger means being received by one of said bottom plates when in said locked position when said bracket means channel is received by said pocket means channel,
said locking means including coacting means on said plunger and on said hook-up bracket means rearwardly of said plunger for maintaining said spring-loaded plunger means in its unlocked condition, said coacting means movable fore and aft into and out of engagement, and
means for automatically disengaging said coacting means for movement of said plunger means to their locked position upon a predetermined amount of pivotal movement of said bracket means relative to said pivotal booms.

4,085,857

FRONT END LOADER WITH IMPROVED APPARATUS FOR OPERATING THE LIFTING ARMS

Fred T. Smith, Newark, Ohio, assignor to Sargent Industries, Inc., Century City, Calif.

Division of Ser. No. 497,129, Aug. 12, 1974, Pat. No. 3,988,979.
This application Aug. 5, 1976, Ser. No. 712,082
Int. Cl.[2] B65F 3/02
U.S. Cl. 214—302 14 Claims



1. In combination in refuse equipment for depositing refuse from a container,
a storage body for the refuse,
means providing an opening in the top of the storage body,
lifting arms pivotally mounted relative to the storage body for lifting the container for obtaining a deposit of the refuse in the container into the storage body through the opening in the top of the storage body,
first hydraulic means operatively coupled to the lifting arms to pivot the lifting arms between a lowered position and a position for obtaining a deposit of refuse into the storage body through the opening in the top of the storage body,
fork arms pivotally coupled to the lifting arms at one end and constructed at the other end to grasp and retain the container for the lifting of the container by the lifting arms,
second hydraulic means operatively coupled to the fork arms to pivot the fork arms,
third hydraulic means operatively coupled to the first and second hydraulic means for obtaining a simultaneous operation of the first and second hydraulic means to provide a lifting of the container by the lifting arms and a simultaneous maintenance of the container in a horizontal relationship by the fork arms,
fourth hydraulic means for indicating any differences in weight on the lifting arms between a full container and an empty container, and
means associated with the third hydraulic means and responsive to an indication by the fourth hydraulic means of an empty container on the lifting arms for inhibiting the operation of the third hydraulic means during the lowering of the lifting arms to maintain the fork arms in position for retaining the containers on the fork arms.

4,085,858

FRONT END LOADER WITH IMPROVED APPARATUS FOR LIFTING THE LIFTING ARMS AND OPENING AND CLOSING THE DOORS

Fred T. Smith, Newark, Ohio, assignor to Sargent Industries, Inc., Century City, Calif.

Division of Ser. No. 497,129, Aug. 12, 1974, Pat. No. 3,988,979.
This application Aug. 5, 1976, Ser. No. 711,864
Int. Cl.[2] B65F 3/02
U.S. Cl. 214—303 38 Claims

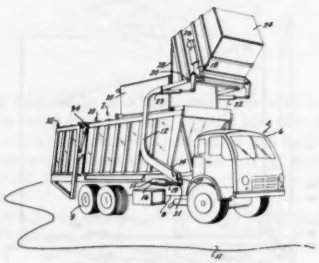
1. A front end loader comprising:
a refuse storage body mounted on a vehicle;
an upper opening into said storage body for depositing refuse within said body;

lifting arms pivotally mounted with respect to said storage body and vehicle for raising and lowering of said arms in picking up a refuse container to dump refuse therefrom through said opening and into said storage body and to return the empty container to ground level;

a closure means for said upper opening;

said closure means positioned adjacent said upper opening with said closure means being movable between an open and a closed position;

first hydraulic motor means, including at least a first cylinder and a first piston, connected to said lifting arms to provide movement of said arms;



second hydraulic motor means, including second cylinders and second pistons, connected to said closure means to provide movement of said closure means;

means to supply hydraulic fluid to said first motor means to drive the first piston in the first cylinder; and

means hydraulically connecting the first and second cylinders to provide for the passage of hydraulic fluid between the first and second cylinders in accordance with the movement of the first piston in the first cylinder and to provide for synchronous operations of the lifting arms and the closure means.

4,085,859

CAR-TOP BOAT LOADER

Roman L. Petron, 836 E. George, Hazel Park, Mich. 48030

Filed Jun. 1, 1976, Ser. No. 691,373
Int. Cl.[2] B60R *9/00*
U.S. Cl. 214—450 **10 Claims**

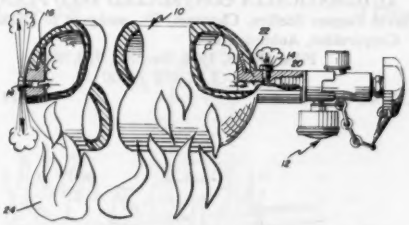
1. A retrofit car-top boat loader for loading a boat, gunwhale down, atop a car already fitted with a car-top carrier of the type that includes spaced front and rear carrier bars fixedly supported on the car top parallel to each other and transverse to the longitudinal centerline of the car, the transverse carrier bars extending generally out to each side of the car top, said loader comprising a loader bar, said bar comprising an elongated member having a cross-section of sufficient dimension to provide an effective abutment along substantially the entire length thereof against which the boat gunwhale can be retained in transit, an effective length at least equal to the maximum width of the boat at the gunwhale and a minimum overall length at least equal to the dimension between the outside edges of the carrier bars, whichever is greater, and a yoke member comprising a generally U-shaped portion having a width sufficient to receive a boat gunwhale with clearance so that the boat gunwhale can be moved without interference through said yoke during loading and unloading and a pivot pin extending from said U-shaped portion, said yoke member being pivotally mounted directly on and to said elongated member near one end thereof, with said yoke member physically engaging said elongated member, said yoke being open away from said elongated member and pivotable, said pivot pin extending normal to the centerline of said elongated member, said effective length being equal to the dimension between said yoke opening and the opposite end of said bar, and means for securing said elongated member directly to the top of the front and rear bars so that said elongated member is disposed entirely above the top surfaces of the front and rear bars.

4,085,860

THERMAL PROTECTION SYSTEM FOR FILAMENT WOUND PRESSURE VESSELS

Russell Olson Hawkins, and James Francis Mallatt, both of Lincoln, Nebr., assignors to Brunswick Corporation, Skokie, Ill.

Filed May 20, 1976, Ser. No. 688,116
Int. Cl.[2] B65D *25/00*
U.S. Cl. 220—89 B **5 Claims**



1. A pressure release device for mounting on a metal element of a light weight fiber wound pressure vessel and for cooperating therewith, comprising:

(a) a thermal release plug having a shank portion and a head portion, the shank portion mountable on the pressure vessel, the head portion open to the atmosphere;

(b) a "T" shaped channel in the plug with the leg of the "T" positioned in the shank of the plug and communicating with the interior of the vessel, and the head of the "T" channel being substantially uniform in cross section, communicating with opposite sides of the head and being in cooperative relationship with the leg for providing a biforcated path to bleed the inside of the vessel;

(c) a heat softening material bonded in the channel, the material having a melting point below the degradation temperature of the vessel and above the maximum ambient operating temperature of the vessel.

4,085,861

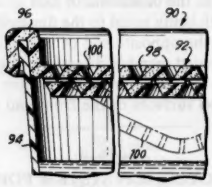
INSULATING DRINK-THROUGH CLOSURE LIDS FOR POTABLE OPEN-TOP CONTAINERS

Stanley L. Ruff, 9 Arbor Dr., New Rochelle, N.Y. 10804

Continuation-in-part of Ser. No. 434,649, Jan. 18, 1974, Pat. No. 3,938,695. This application Dec. 31, 1975, Ser. No. 645,567
The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.4 **5 Claims**

1. A drink-through closure lid for detachably capping the open top of a hot potable container, said lid having a crown and peripheral means for releasably sealingly engaging the lip of the container, means providing at least one opening in the crown through which the hot potable in the container may be drunk through the lid, while the lid is in container-capping position, and means providing an upper surface of low heat conductivity over at least the portion of the top surface of said crown engaged by the inner surface of the lip of a person

drinking the hot potable in the container through the lid, said lid being provided with flutes juxtaposed with the means providing at least one opening in the crown and being expandable



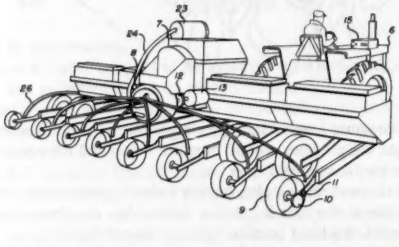
downwardly upon application of manual downward pressure to the crown whereby to form a depression to accommodate the nose of a person drinking the hot potable from the container through the lid.

4,085,862

AUTOMATICALLY CONTROLLED SEED PLANTER

David Eugene Steffen, Chatham, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Oct. 8, 1976, Ser. No. 730,784
Int. Cl.[2] G07F *11/00*
U.S. Cl. 221—8 **19 Claims**



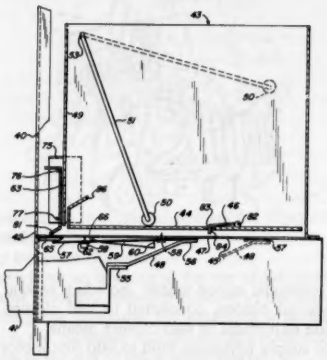
1. An automatically controlled mobile seed planter apparatus having at least one rotatable drum means for holding a plurality of seeds, motor means for rotating the drum means, said drum means having a plurality of holes, said holes being smaller than said seeds, air pressure means for holding a plurality of said seeds against said holes as said drum means rotates, and means for releasing said seeds from said holes at a predetermined point in the rotation of said drum means, a means for receiving said seeds from said releasing means, and forming a path of travel for the passage of seeds therethrough to a desired point of discharge, variable speed control means for said motor means, a first transducer means for detecting the rotational speed of said drum means and providing a drum speed signal, second transducer means for detecting the speed of said planter along the ground and providing a ground speed signal, control means comprising input means for providing both a desired seed spacing signal and a drum hole configuration signal, means for receiving said drum speed, ground speed, drum hole configuration, and desired seed spacing signals, means for comparing said desired seed spacing signal with said drum hole configuration signal, said ground speed signal and said drum speed signal, means for providing an output control signal from said comparing means to said variable speed control means, to adjust the variable speed control means in response to changes in the drum speed signal, the ground speed signal, the drum hole configuration signal or the desired seed spacing signal and combinations thereof, for maintaining desired seed spacing corresponding to said desired seed spacing signal, means for combining said drum speed signal and said ground speed signal and providing an expected seed spacing signal in response thereto, readout means for displaying said expected seed spacing signal, means for detecting excessive rotational speed of the drum, absence of drum rotation, absence of drum speed signal, and absence of ground speed signal of a minimum predetermined value and producing malfunction signals in response thereto, and means for displaying said malfunction signals.

4,085,863

MAP VENDING MACHINE

Ralph S. Johnson, 907 Frontier Park Ave., Cheyenne, Wyo. 82001

Filed Aug. 7, 1975, Ser. No. 602,829
Int. Cl.[2] G07F *11/16*
U.S. Cl. 221—20 **17 Claims**



1. The method of dispensing generally flat documents or the like from a stack in a container having a slot opening in the lower extremity of a vertical wall thereof, the document container having an actuator associated therewith for providing a reciprocal motion cycle of a linear forward portion and a linear backward portion, comprising the steps of:

applying a downward pressure across at least a portion of the upper surface of the uppermost document in the stack,

gripping the lowermost document of the stack by embedding a pin into the lowermost document when the reciprocal motion is at the end of the forward portion,

sliding the gripped lowermost document into the container aperture by coupling the linear backward motion to the embedded pin,

withdrawing the pin from the lowermost document at the end of each linear backward motion portion, and

maintaining the pin clear of the lowermost document for all but the last segment of each linear forward motion portion.

4,085,864

NEWSPAPER VENDING MACHINE

Roger G. Gordon, San Leandro, Calif., assignor to Safe Rack, Inc., San Leandro, Calif.

Filed Oct. 12, 1976, Ser. No. 731,135
Int. Cl.[2] G07F *11/08*
U.S. Cl. 221—155 **5 Claims**

1. A newspaper vending machine or the like, comprising in combination:

a. a base member with catches;

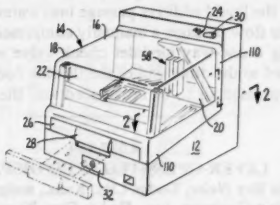
b. a generally horizontal surface formed on said base member adapted to hold a plurality of flat articles;

c. a transparent cover for said plurality of flat articles, said transparent cover having a transparent front, sides a top and catches engaging said catches on said base;

d. a pair of locking pins slidably mounted in each side of said cover, said pins having biasing means normally biasing said pins to extend downwardly into mating holes in said base member preventing lateral movement of said cover with respect to said base;

e. a coinbox slidably mounted in said base, said coin box having cam surfaces on each side thereof;

f. a pair of slidably mounted transverse rods having cam followers thereon on the inside ends thereof, said cam followers pressing on the cams on the sides of the coin box, said transverse rods having cam surfaces on the opposite ends acting on said pins whereby when said coin



box is inserted in said base, said transverse rods are retracted away from said box, causing said pins to lock said cover onto said base and wherein said cam surfaces on said coinbox are actuated by said coin box to withdraw said pins from said base when said coin box is withdrawn, thereby

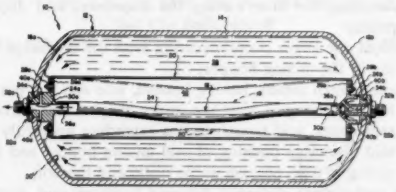
g. permitting said transparent cover to be lifted completely off of said base.

4,085,865

ELASTOMERIC BLADDER FOR POSITIVE EXPULSION TANK

Leo M. Thompson, Niagara Falls; Robert K. Anderson, Lockport; Lawrence H. Kocher, Tonawanda, and John W. Jackel, Grand Island, all of N.Y., assignors to Textron Inc., Providence, R.I.

Filed May 13, 1976, Ser. No. 685,753
Int. Cl.[2] B67D *5/54*
U.S. Cl. 222—1 **3 Claims**



1. A method of storing a fluid product in a positive expulsion tank and subsequently expelling said product from said tank by means of an expulsion fluid wherein the tank is to be subject to storage within a range of temperatures including a minimum design temperature and a maximum design temperature and is characterized as enclosing a bladder having an as-fabricated configuration and formed of a resiliently deformable material, which tends to become "set" when maintained under said minimum design temperature and is subject when "set" while in a relatively highly tensioned condition to damage/failure upon the application to said tank of handling/transport forces, said method including the steps of:

mounting said bladder within said tank to define a boundary between a product receiving cavity and an expulsion fluid receiving cavity which are disposed one relatively outwardly of said bladder and the other relatively inwardly of said bladder and which inversely vary in volume as said bladder is subjected to first and second tension modes, a first of said tension modes evolving an expansion of said bladder from said as-fabricated configuration to decrease the volume of said product receiving receiving to effect expulsion of product therefrom, the other of said tension modes evolving an expansion of said bladder from said as-fabricated configuration to decrease the volume of said expulsion fluid receiving cavity to accommodate for an increase in volume of said product within said product receiving cavity incident to an increase in temperature thereof between said minimum design temperature and said maximum design temperature;

filling said product receiving cavity with said product at a filling temperature disposed within said range of temperatures and at a volume at said filling temperature permitting said product to fill said product receiving cavity at said minimum design temperature while permitting said bladder to assume said as-fabricated configuration; and

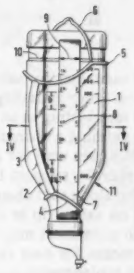
introducing said expulsion fluid into said expulsion fluid receiving cavity at least when said product is to be expelled from said product receiving cavity.

4,085,866

GRADUATED CONTAINER

Werner Fekl, Erlangen, Germany, assignor to J. Pfrimmer & Co., Erlangen, Germany

Filed Sep. 22, 1976, Ser. No. 726,015
Claims priority, application Germany, Mar. 13, 1976, 7607842
Int. Cl.[2] B67D *5/38*
U.S. Cl. 222—158 **1 Claim**



1. A device for dispensing fluid at a controlled rate, comprising a container for said fluid having means associated therewith for regulating the rate of fluid discharge therefrom, said container being at least partially transparent to permit viewing of the fluid level in the container, a scale means having indicia thereon calibrated in units of time longitudinally thereof and including a zero-time datum marking for relating the changing liquid level within the container to the passage of time, said scale means being initially independent of said container, and mounting means for mounting said scale means on said container so as to extend longitudinally thereof with said zero-time datum marking on said scale means in alignment with the initial fluid within the container to thereby relate changes in the fluid level in the container to the indicia on said scale means, said mounting means comprising a flexible mounting halter including a pair of spaced ring elements adapted to be mounted adjacent opposed ends of the container and a rib connected therebetween, a flappable loop element being connected to one of said ring elements for suspending the container in dispensing position, said ring elements, when the container is suspended in dispensing position, bearing against the scale means to retain same in fixed position relative to the container.

4,085,867

DISPENSING CONTAINERS AND HOLDER

Peter Van Nest Heller, 213 Esplanade, San Clemente, Calif. 92672

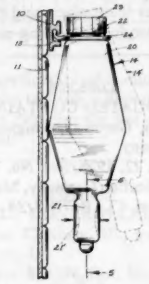
Filed Jul. 26, 1976, Ser. No. 708,373
Int. Cl.[2] B67D *3/00*
U.S. Cl. 222—181 **6 Claims**

1. Dispensing containers and holder for liquid shampoo and the like, comprising, in combination:

(a) an elongated flat strip having securing means on its rear surface for fastening the strip to a bathroom wall and defining on its front surface a horizontally extending track means:

(b) a plurality of identically constructed containers, each having a main chamber and smaller pump chamber integrally formed beneath the main chamber, the top of the main chamber having a threaded neck defining a fill opening and a threaded cap receivable over said neck; and

(c) a washer shaped member with detent projections on the washer faces receivable over said threaded neck for se-



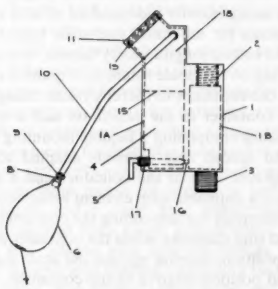
curement to the container by said cap with cooperating detent depressions and including an integral laterally extending flange terminating in an upturned bead portion, said track means defining a channel facing forwardly with an undercut in its upper wall for receiving said upturned bead portion to thereby support the container in any set horizontal position along said channel so that said containers may be held on said strip in side-by-side relationship and whereby said containers may be hung, swung or slid from said track means for easy removal and use in other bathrooms or for replacement.

4,085,868

BATH OIL INJECTION DEVICE FOR SHOWER BATH

Robert Lynn Blair, Box 2515, Sarasota, Fla. 33578

Filed Sep. 1, 1976, Ser. No. 719,702
Int. Cl.² B05B 7/32
U.S. Cl. 222—193 **1 Claim**



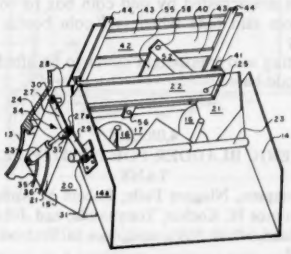
1. A shower bath attachment comprising: a housing; a reservoir for liquid additive formed in the housing; a filling opening and an air inlet opening formed in the housing and leading from outside the housing to the reservoir; a closure cap for the filling opening; a one-way check valve positioned in the air inlet opening allowing air to enter the reservoir; an open-ended water flow passage formed in the housing; couplings at the upstream and downstream ends of the water flow passage for connection, respectively, to a shower supply pipe and a shower spray head; a liquid additive passage formed in the housing for conducting liquid additive from the reservoir to the water flow passage; a manually adjustable needle valve, accessible from outside the housing, positioned in the liquid additive passage for controlling the flow of liquid additive through the passage; a flexible conduit having one end connected at the exterior of the housing to the air inlet opening for introducing compressed air into the reservoir to urge liquid additive from the reservoir through the liquid additive passage into water flowing through the water flow passage; a manually compressible resilient bulb, including a one-way air inlet check valve and an air outlet, connected to the other end of the flexible conduit for developing compressed air to be introduced into the reservoir.

4,085,869

LEVER-OPERATED FEED DISPENSER

Benjamin Ray Neier, Dodge City, Kans., assignor to B J Manufacturing Company, Inc., Dodge City, Kans.

Filed Dec. 2, 1976, Ser. No. 746,698
Int. Cl.² B65G 33/14
U.S. Cl. 222—271 **12 Claims**



1. An improved feed dispenser for conveying a flow of mixed feed from a discharge opening of a mixing hopper and for directing the flow exiting the dispenser, said dispenser comprising:

at least one auger communicating with the discharge opening of the mixing hopper;

auger trough means, having bottom, side and top portions, for containing at least the lower longitudinal portion of said auger, said trough means extending upwardly from said discharge opening of said mixing hopper and terminating in a lip portion at the distal end thereof;

an outlet door slideably disposed between said discharge opening of said mixing hopper and said trough means;

means connected to said outlet door for sliding said outlet door to communicate the proximal end of said trough means with the mixing hopper, said means comprising:

lever means fulcrummed at a central portion thereof;

a fluidic cylinder having a connected end and an operative end and attached at its operative end to a first end of said lever means; and

bar means pivotably mounted at one end thereof to said slideable door, said bar means pivotably connected at the other end thereof to the second end of said lever means,

whereby when said fluidic cylinder retracts said attached first end of said lever is drawn toward said cylinder turning said lever means about to central fulcrum, thereby to propel said slideable door in a direction opposite to the retraction;

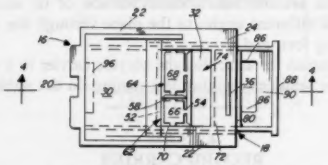
retractable spout means disposed at the distal end of said trough means for closing the distal end of said trough means when in a first position and for directing the flow of the feed existing said trough means when in a second position; and

means connected to said spout means for moving said spout means between the first and second positions.

4,085,870
DISPENSING DRAWER ASSEMBLY

John W. Von Holdt, 6864 Lexington La., Niles, Ill. 60648

Filed Nov. 5, 1976, Ser. No. 739,200
Int. Cl.² G01F 11/18
U.S. Cl. 222—361 6 Claims

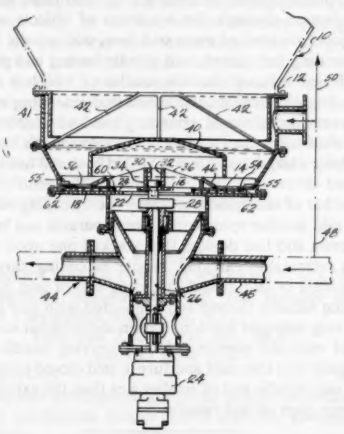


1. A dispensing drawer for use in a dispensing drawer assembly having a wall spaced from a passage transmitting material from a container for deposit on said wall and thereafter movable by said drawer from said wall for dispensing the material in response to the movement of the drawer to an open position, the improvement comprising: means carried by said drawer for selecting the volume of material deposited on said wall, said volume selecting means including a plurality of chambers with at least one of said chambers having a removable metering wall, said removable metering wall having its major plane extending transverse said passage to capture material in the metering wall chamber and prevent passage of the material past said metering wall; and frangible means coupling said metering wall to the walls defining the metering wall chamber, whereby said metering wall may be removed by breaking said frangible means.

4,085,871
ORBITAL PLATE FEEDER

Frank J. Miksitz, 603 Barrymore St., Phillipsburg, N.J. 08865

Filed Jun. 1, 1976, Ser. No. 691,303
Int. Cl.² B65G 65/48
U.S. Cl. 222—404 11 Claims



1. In apparatus for feeding granular material with gravity assist from a mass of the material, said apparatus having a shroud positioned with at least its lower end disposed within the mass of material, a horizontal centrally apertured feed plate disposed directly below the shroud and having an upper surface at least partially exposed to the mass of material, the arrangement being such that the material does not flush freely through the central aperture in the feed plate, and means for orbiting said feed plate about a vertical axis so that during orbital movement of the feed plate material from the mass passes in a controlled manner into the central aperture in the feed plate, the improvement comprising an annular plate disposed within the mass of material independent of the feed plate, said plate closely overlying at least the leading edge of the orbiting feed plate while leaving a radially inward portion of the plate exposed to the mass of material, thereby reducing the tendency of the feed plate to become jammed by the granular material.

4,085,872
SLING FOR TENNIS RACKET

Kenneth Foo, New York, N.Y., assignor to Theodore Gottlieb, New York, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,708
Int. Cl.² A41D 27/20; B65D 85/00
U.S. Cl. 224—5 D 4 Claims

4. A carrier for a tennis racket comprising a strap dimensioned to extend diagonally across one side of the upper body of the user, from shoulder to opposite hip; said strap forming loops at each end thereof; one loop being larger than the other; the larger loop being of elastic fabric and being sized to clampingly engage the grip of the racket; the smaller loop to house means for affixing the strap to the racket frame; the racket when thus affixed to its carrier forming a part rigid, part elastic structure which can be diagonally clamped across the body as aforesaid.

4,085,873
KNAPSACK WITH INTEGRAL STORAGE AND CARRYING POUCH

Judith J. Schweitzer, 431 N. Armistead St., #T-5, Alexandria, Va. 22312

Filed Sep. 7, 1976, Ser. No. 720,526
Int. Cl.² A45F 3/04
U.S. Cl. 224—8 R 13 Claims

1. In a portable receptacle made of thin, flexible material, said receptacle being a knapsack having a wall, and means permitting said knapsack to be carried on the back of the user, the improvement comprising:

a patch of said material attached to said wall around the perimeter of said patch;

an opening through said patch within said perimeter to provide access to the volume between said patch and said wall whereby the portion of said wall covered by said patch may be pushed out through said opening whereby said patch is reversed in order that the side of said patch which is next to said portion prior to pushing said portion through said opening forms a portion of the exterior surface of a pouch and when said pouch is formed the recep-

tacle may be stuffed into the pouch for ease of storage and transportation and

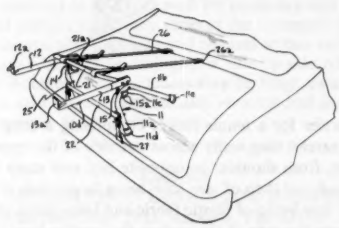
first closure means operable for shutting said opening after said receptacle has been stuffed into said pouch.

4,085,874

AUTOMOBILE BICYCLE CARRIER

Joseph V. Graber, 3739 County Trunk M, Middleton, Wis. 53562

Filed Jan. 2, 1976, Ser. No. 646,175
Int. Cl.[2] B60R 9/10
U.S. Cl. 224—29 R **6 Claims**



1. An automobile bicycle carrier comprising:

(a) a pair of rigid generally U-shaped side frames disposed in relatively parallel planes, said side frames each being of one-piece tubular stock and having an arcuate intermediate portion and two straight leg portions integral with the ends of the respective intermediate portion and diverging therefrom at an acute angle along lines generally tangent to the ends of the arcuate intermediate portion, whereby the spacing between the leg portions of each side frame is substantially greater at the free ends thereof than adjacent the respective arcuate intermediate portion; the leg portions having resilient vehicle engaging feet on the free ends thereof, one of said leg portions on each side frame being shorter than the other leg portion and extending generally perpendicular to a plane through the vehicle engaging feet, the other leg portion of each side frame extending at an acute angle to the plane through the vehicle engaging feet,

(b) a pair of elongated bicycle support arms each of tubular stock and each having an upturned bicycle stop at one end,

(c) a U-shaped cross member having lateral end portions connected to the other ends of respective ones of the bicycle support arms and a connecting portion extending between said lateral end portions to effect movement of said bicycle support arms in unison and to maintain said arms in parallel spaced relation,

(d) said arcuate intermediate portions of said side frames each having spaced openings therethrough perpendicular to the plane of the respective side frame, means including fasteners extending through said spaced openings in the arcuate intermediate portions of the side frames attaching said other ends of said bicycle support arms to the arcuate intermediate portion of respective ones of said side frames for angular adjustment of the arms in planes paralleling the side frames through a plurality of positions with each of the arms extending generally horizontally outwardly from the arcuate intermediate portion of its associated frame at different angles to the plane through the vehicle engaging feet, and

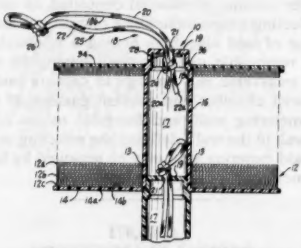
(e) strap means for attaching the bicycle carrier to a vehicle with the vehicle engaging feet resting on the vehicle.

4,085,875

RECORD CARRIER

Louis Campbell, 1503 Meadowview La., Martinsville, Va. 24112, and Edward G. Keshock, 1625 Kingsway Rd., Norfolk, Va. 23518

Filed Mar. 15, 1976, Ser. No. 666,757
Int. Cl.[2] B65D 71/00
U.S. Cl. 224—45 K **7 Claims**



1. An apparatus for carrying a stack of objects each of which has an aperture extending through it, the apparatus comprising:

(a) a base;

(b) a tubular spindle extending from said base, adapted for projection through the apertures of objects when said objects are stacked upon said base, said spindle having its extending end closed, said spindle having end portions of different external size the smaller of which is at the extending end of said spindle and said extending end has an aperture in its closed extending end and which said aperture is smaller than the interior of said spindle, said spindle having a larger end portion at said base and has its interior sized to receive the extending smaller end portion of another of said spindle whereby the extending end portion of said another spindle of a like apparatus can be inserted therein and like devices thus stacked one upon another;

(c) a retractable carrying handle extending through said aperture in said closed extending end of said spindle and being slidable therein and connected with said spindle by having enlarged portions within and without said spindle, said enlarged portions of said carrying handle being of greater size than said aperture in said closed extending end of said spindle and of smaller size than the exterior of said larger part of said spindle.

4,085,876

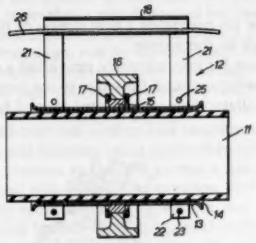
HOSE FITTING

Raymond Albert Buckell, 41, Belmont Crescent, Maidenhead, Berkshire, England

Filed Jul. 22, 1976, Ser. No. 707,538
Claims priority, application United Kingdom, Jul. 22, 1975, 30624/75
Int. Cl.[2] B65D 71/00
U.S. Cl. 224—45 R **5 Claims**

1. A hose fitting comprising a sleeve through which a hose

extends, a wheel mounted to rotate around the sleeve about the axis of the sleeve, and a handle attached to the sleeve and



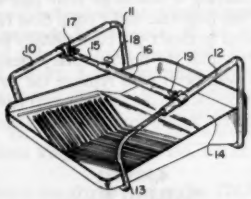
including a hollow tube parallel with and displaced from the sleeve axis, and supply lines which extend through the hollow tube.

4,085,877

PAINT TRAY CARRIER

George M. Hildebrand, P.O. Box 135, Junction City, Calif. 90648

Filed Jan. 19, 1977, Ser. No. 760,682
Int. Cl.[2] A47G *23/06*
U.S. Cl. 224—48 R 3 Claims



1. A paint tray carrier and paint tray combination comprising: a paint tray; an endless tubular bracket configured to surround the paint tray and comprising a pair of spaced and parallel lower transverse tubular sections adapted to extend under the tray and a pair of spaced and parallel upper longitudinal tubular sections adapted to extend above the tray at each side thereof; and a handle member extending across the tray from one of the upper sections to the other, and which includes at least one clip member attached to and projecting downwardly from the undersurface of the tray to engage one of the lower transverse tubular sections of the bracket.

4,085,878

DISPENSER-CUTTER FOR TACKY FABRIC MATERIALS

Joseph Anthony Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 766,472
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—19 8 Claims

1. Apparatus for dispensing random length cut pieces from a supply of continuous length fabric product, comprising, in combination:

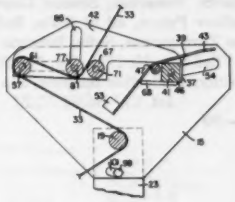
a fixed frame provided with a pair of side plates disposed in a fixed parallel juxtaposed generally vertical orientation each with respect to the other, separated by a distance greater than the width of the fabric product to be dispensed;

a moveable carriage disposed between the frame side plates and arranged and adapted to move reciprocally in a generally horizontal locus between first and second positions relative to the fixed frame, having carriage side plates arranged and disposed in parallel relationship each with respect to the other and generally parallel to the frame side plates, separated by a distance greater than the width of the fabric product to be dispensed;

fabric cutting blade means on the movable carriage mounted with a blade cutting edge upwardly oriented transversely of and extending between proximal ends of the carriage side plates;

first roller means extending transversely between distal ends of the carriage side plates;

second roller means extending transversely between the carriage side plates at a location between the proximal and the distal ends thereof;



third roller means extending transversely between the carriage side plates at a location between the first roller means and the second roller means, moveable reciprocally vertically with respect to said carriage side plates between a first position in which it will depress fabric spanning the first and second roller means when the moveable carriage is in its first position, and a second position to which it is urged by tensioned fabric when the carriage is in its second position; and

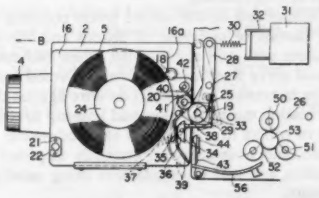
cutting blade guard means mounted transversely of the fixed parallel side plates, arranged and disposed to shield the fabric cutting blade cutting edge when the carriage is in its first position.

4,085,879

PAPER SUPPLYING DEVICE IN COIN WRAPPING APPARATUS

Iizuka Nobuhiro, Himeji, Japan, assignor to Glory Kogyo Kabushiki Kaisha, Himeji, Japan

Filed Jun. 28, 1977, Ser. No. 810,818
Claims priority, application Japan, Jul. 5, 1976, 51-79600
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—93 4 Claims



1. In a paper supplying device in a coin wrapping apparatus, comprising a movable paper carrying body and a plurality of paper supporting members provided on said paper carrying body, each of the paper supporting members supporting a specific kind of paper wound into a roll and adapted for wrapping a corresponding kind of coins, said paper carrying body being movable for bringing the paper supporting member corresponding to a selected kind of coins into a paper supplying position facing a coin wrapping mechanism of the coin wrapping apparatus, the improvement comprising a single cutting blade provided stationarily at a position between the paper carrying body and the coin wrapping mechanism and

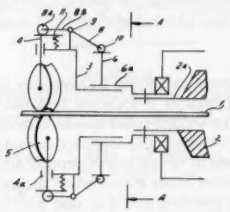
apart from the path of the movement of the paper carrying body, for cutting the paper into a piece of a predetermined length, and means for guiding paper provided in each of said paper supporting members for retracting the leading end of the wrapping paper from said path during the paper changing movement of said paper carrying body.

4,085,880

DEVICE FOR PLANETARY ELECTRODE WIRE-FEEDING HAVING AUTOMATIC ADJUSTING MEANS FOR THE PUSHING FORCE EXERTED ON THE ELECTRODE WIRE

David Albert Samokovliski; Petko Kostadinov Grozdanov; Alfred Emmerich Nemechek; Simeon Georgiev Punchev, and Peter Dimitrov Petrov, all of Sofia, Bulgaria, assignors to Institute po Zavaryavane, Sofia, Bulgaria

Filed Sep. 24, 1976, Ser. No. 726,424
Claims priority, application Bulgaria, Sep. 24, 1975, 33771
Int. Cl.² B65H *17/22*
U.S. Cl. 226—90 **8 Claims**



1. A device for planetary feeding of an electrode-wire by means of a pair of rollers which are adapted to contact and convey the electrode-wire with a force that is automatically adjusted, comprising in combination,

a rotatable housing having an axial bore through which the electrode-wire is adapted to be fed, said housing having a pair of radially extending bores;

a pair of pistons reciprocally mounted in said pair of bores, each piston rotatably supporting a roller of said pair of rollers, the axes of said pair of rollers being skewed relative to each other;

biasing means connected to said pair of pistons and biasing them radially outwardly relative to said electrode-wire;

a motor having a drive shaft;

a cam drivingly connected to said drive shaft;

a pair of double-armed levers being fulcrumed to opposite sides of said housing;

a first arm of said double-armed levers coacting with one of said pistons of said pair of pistons and the second arm coacting with said cam, so that when said cam is rotated by said drive shaft said first arm is pivoted and urges said piston to contact said electrode-wire against the action of said biasing means to cause said housing to rotate and said pair of rollers to convey said electrode-wire;

said cam and housing being coaxially disposed for mutual coaction and said electrode-wire being axially fed therethrough.

4,085,881

APPARATUS FOR ADVANCING A LINEAR FIBROUS ELEMENT

Cletis L. Roberson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 581,257, May 27, 1975, Pat. No. 4,005,505. This application Jun. 25, 1976, Ser. No. 699,922
Int. Cl.² B65H *17/28*
U.S. Cl. 226—95 **4 Claims**

1. Apparatus for advancing a strand comprising:

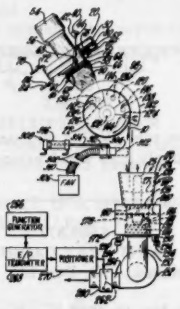
a driven hollow rotary means for advancing a strand, such rotary means having an interrupted wall portion defining an external peripheral surface for engagement with the strand;

a fluid supply;

a nozzle;

a regulator for providing a first stream of fluid having a first flow rate to the nozzle;

an oscillator for intermittently providing a second stream of fluid having a second flow rate to the nozzle, the regulator and oscillator being connected to and between the fluid



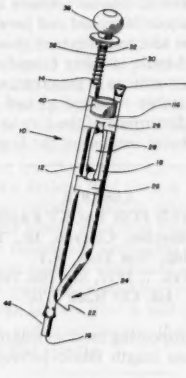
supply and the nozzle in parallel relationship with each other to provide a continuously flowing stream of fluid to the nozzle having a discharge flow rate that oscillates between a bias flow rate and a pulse flow rate, the nozzle being oriented to direct the continuously flowing stream of gas from within the hollow rotary means toward the interrupted wall portion to remove the strand from the external peripheral surface and to impart lateral oscillation to the strand advancing from the rotary means.

4,085,882

NAILING TOOL

Robert Stamper, 302 E. High St., Huntington, Ind. 46750

Filed Feb. 24, 1977, Ser. No. 771,440
Int. Cl.² B25C *1/02*
U.S. Cl. 227—110 **7 Claims**



1. A nailing tool comprising an elongated ram rod tube having upper and lower ends and a smooth, uniform internal bore dimensioned to coaxially and slideably receive a nail therein, means for feeding nails into said lower end into a nailing position substantially coaxial therewith, said nail feeding means including an elongated nail feeding tube having an inside diameter dimensioned to slideably and coaxially receive a nail therein and being fixedly secured to said ram rod tube in generally parallel spaced-apart relationship thereto, one end of

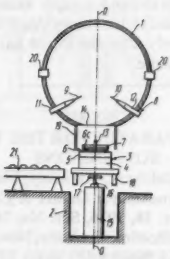
said nail feeding tube being angled inwardly and intersecting said ram rod tube at an oblique angle, the interior of said nail feeding tube and the interior of said ram rod tube forming a smooth junction, whereby, a nail deposited into said nail feeding tube will pass therethrough into said nailing position, ram rod means including a ram rod for driving a nail in said nailing position into a work piece, said ram rod being reciprocally moveable in said ram rod tube between retracted and nail striking positions, and being complementary to the bore of said ram rod tube, said ram rod closing said junction when in said striking position, said junction being open when said ram rod is in said retracted position to thereby permit a nail held in said feeding tube to pass into said nailing position, foot attachment means removeably secured to said lower end, and including at least one positioning surface for locating said tool with respect to said workpiece, and thereby a nail being driven by said tool, a nail holder fixedly secured to said tool adjacent the upper end of said ram rod tube, said nail holder including an open container having a magnetic surface, nails deposited in said holder being removeably retained therein by said magnet.

4,085,883

INSTALLATION FOR EXPLOSIVE TREATMENT OF MATERIALS

Andrei Andreevich Deribas, ulitsa Pravdy, 1, kv. 20; Alexandr Fedorovich Demchuk, ulitsa Tereshkovoi, 12, kv. 6, both of Novosibirsk; Rudolf Aronovich Braunshtein, prospekt Metallurgov, 34, kv. 28, Novokuznetsk Kemerovskoi oblasti; Boris Nikolaevich Bochkarev, ulitsa Sovetskaya, 79 a, kv. 59, Novosibirsk; Vladimir Borisovich Viktorov, ulitsa Kurako, 4, kv. 48, Novokuznetsk Kemerovskoi oblasti; Gennady Semenovich Karkishko, prospekt Metallurgov, 15, kv. 4, Novokuznetsk Kemerovskoi oblasti; Sergei Vasilievich Baranov, prospekt Metallurgov, 25, kv. 8, Novokuznetsk Kemerovskoi oblasti; Alexandr Ivanovich Prakhov, ulitsa Sheinkmana, 24, kv. 11, Sverdlovsk; Vladimir Semenovich Kasatkin, ulitsa Ordzhonikidze, 2 a, kv. 52, Sverdlovsk, and Alexandr Timofeevich Rozhkov, ulitsa Volgogradskaya, 184, kv. 83, Sverdlovsk, all of U.S.S.R.

Filed Sep. 22, 1976, Ser. No. 725,505
Int. Cl.[2] B23K *21/00*
U.S. Cl. 228—2.5 **5 Claims**



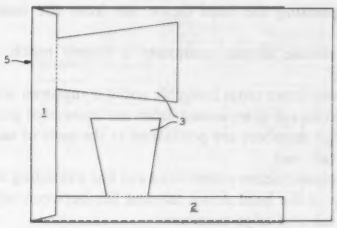
1. An installation for explosive treatment of materials comprising: a fixed support; a chamber mounted on said fixed support; an opening provided in the wall of said chamber in the bottom part thereof; a work table for supporting the material being treated, the work table being adapted for reciprocal movement between a lowermost position out of engagement with the sides of said opening and an upmost position tightly sealing said opening; an explosive charge on said work table; a system for initiating an explosion; a drive for effecting the reciprocal movements of said work table mounted on said fixed support; said work table being made in such a form that, upon introduction into said chamber, it tightly seals said opening; the walls of said chamber adjacent to said opening being inclined to the horizontal plane at an angle which is greater than the angle of friction of the treated material with the walls of said chamber, whereby the treated material is fed under gravity to said work table while the latter is being withdrawn from said chamber; a ventilation system mounted in said chamber for removing detonation products of said explosive charge.

4,085,884

PAPER SUPPLY BOX

Helmut Johann Högenett, Kreuzstr. 5, Inden, Germany (D 5176), and Valentin Raimund Veithen, Buirer Str. 35, Golzheim, Germany (D 5159)

Filed Nov. 16, 1976, Ser. No. 742,247
Claims priority, application Germany, Nov. 17, 1975, 7536471[U]
Int. Cl.[2] B65D *5/72*
U.S. Cl. 229—17 S **4 Claims**



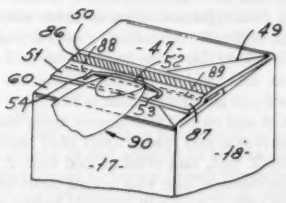
1. An improved box of the type used as a paper supply container for copying and recording equipment and the like, the improvement comprising at least one end of said box being adapted to provide an open end for removal therethrough of paper sheets from the interior of said box, said box being made of a folded die cut material and having therewithin a folded over portion disposed adjacent ends thereof other than said one end of said box, at least two movable flaps in the interior of said box, said flaps each having one end fastened in the interior of said box and an opposite free end, said flaps each lying in an initial position within said box against one wall of said box and being adapted to move from said initial position towards an opposite wall of said box, as paper is removed therefrom, to a position in which said flaps block full insertion of other paper sheets into the interior of said box.

4,085,885

LIQUID PROOF FLAT TOP CONTAINER WITH THUMB NOTCH RELEASE MEANS

Robert E. Lisiecki, Orchard Lake; Duncan J. Crawford, Franklin, and Daniel J. Wise, Farmington, all of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Jul. 23, 1976, Ser. No. 707,969
Int. Cl.[2] B65D *5/72, 5/54*
U.S. Cl. 229—17 R **23 Claims**



1. In a paperboard container, the combination, comprising:
(a) a tubular body having a flat top and closure thereon;
(b) said flat top end closure overlying said body, and including first and second triangular panel members folded flat over the top end of said body, and a pair of rectangular

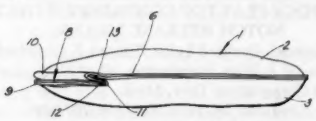
shaped panels defined as inner and outer roof panels which are folded over said triangular panel members;
(c) each of said triangular panel members is flanked by a pair of fold back panels which join said triangular panel members to said inner and outer roof panels;
(d) first and second pouring panels as part of said fold back panels flanking said first triangular panel member;
(e) first and second closure panels as part of said fold back panels flanking said second triangular panel member;
(f) a sealing rib including said inner and outer roof panels, said first and second pouring panels and said first and second closure panels;
(g) a hold down tab sealing the outer roof panel to said inner roof panel;
(h) said hold down tab being provided with release means for separating the hold down tab from the inner roof panel;
(i) said release means comprises a thumb notch release means;
(j) said hold down tab is frangible and it is ruptured when the hold down tab is separated from the inner roof panel and seal edge members are positioned at the ends of said hold down tab; and
(k) said release means comprises a cut line extending longitudinally of the hold down tab and lies between said hold down tab seal edge members.

4,085,886

RECLOSABLE TWIN-Z-FOLD DISPENSING VALVE CONSTRUCTION FOR A LIQUID CONTAINING FILM POUCH

Masato Nishioka, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 3, 1977, Ser. No. 756,442
Int. Cl.[2] B65D *33/38*
U.S. Cl. 229—62.5 **8 Claims**



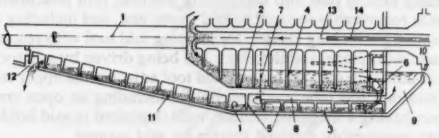
1. A reclosable valve for controlling the flow of a liquid between first and second liquid-proof flexible films joined together in a fluid-tight seal along at least two spaced apart edge portions, said valve comprising a twin-Z fold incorporating both of said films and extending between said spaced apart edge portions, said twin-Z fold comprising first and second oppositely oriented and spaced folds in said films, said first and second films at said twin-Z fold therein being sealed together and to themselves at said spaced apart edge portions to maintain said twin-Z fold, said films at said twin-Z fold therein being discrete between said two spaced apart edge portions, whereby said twin-Z fold will partially unfold between said two edge portions to form a passage for said liquid when said valve is subjected to fluid pressure sufficient to cause said unfolding, said twin-Z fold refolding sufficiently to prevent further passage of said liquid therethrough when said fluid pressure is reduced to a value below that sufficient to cause said unfolding.

4,085,887

CENTRIFUGE FOR DRAINING OFF SEWAGE SLUDGE

Jørgen Steen 4, Bye-Jørgensen, Jernbane Alle, 3050 Humlebaek; Gunnar Valdemar Hartvig Larsen, 15, Sofienbergvej, 2960 Rungsted Kyst, and Poul Henrik Vermehren, 64, Slotsvej, 2920 Charlottenlund, all of Denmark

Filed Apr. 12, 1976, Ser. No. 675,898
Claims priority, application Denmark, Apr. 21, 1975, 1702/75
Int. Cl.[2] B04B *1/20*
U.S. Cl. 233—7 **8 Claims**



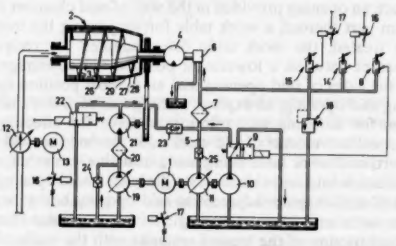
1. In a centrifuge for separating solids, such as sewage sludge, from liquid in which the solids are initially suspended, inner rotary drum and scraper means for receiving the liquid with the solids suspended therein and for subjecting them to an initial separating stage, outer rotary drum and scraper means coaxially surrounding said inner rotary drum and scraper means for subjecting the liquids and solids to a final separating stage, said outer rotary drum and scraper means including a drum formed at opposed end regions with outlets for the separated solids and liquid, respectively, and passage means operatively connected with both of said inner and outer rotary drum and scraper means for providing a common path of travel for the liquid and solids flowing from said inner rotary drum and scraper means subsequent to the initial separating stage to said outer rotary drum and scraper means to be subjected to the final separating stage, said inner rotary drum and scraper means initially receiving the liquids and solids suspended therein at one end region of said inner rotary drum and scraper means and feeding the liquids and solids during the initial separating stage toward an opposite end region of said inner rotary drum and scraper means, said passage means communicating with said inner rotary drum and scraper means at said opposite end region thereof, and said liquid outlet of said drum of said outer rotary drum and scraper means communicating primarily only with said outer rotary drum and scraper means for receiving liquid only after the liquid has been subjected to said final separating stage.

4,085,888

PROCESS AND APPARATUS FOR THE TREATMENT OF SUSPENSIONS

Ernst Adolf Jäger, Vilsbiburg, Germany, assignor to Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG, Germany

Filed Nov. 18, 1976, Ser. No. 743,076
Claims priority, application Germany, Nov. 18, 1975, 2551789
Int. Cl.[2] B04B *1/20, 9/10, 11/02*
U.S. Cl. 233—7 **39 Claims**



1. In a solid-shell screw-type conveyor centrifuge system,

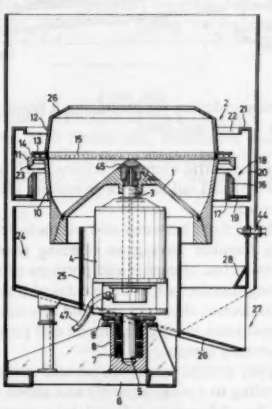
the centrifuge having a screw which rotates at a differential speed with respect to the shell, one of the shell and the screw being coupled to a drive mechanism and the other of the shell and screw being rotated by means of a hydraulic motor, the improvement comprising: means for sensing an accumulation of solid matter in conveying channels of the screw, means for comparing the sensed accumulation of solid matter with a desired optimum accumulation of solid matter, and means for controlling the differential speed between the shell and the screw in response to a signal from said comparing means such that the differential speed is increased upon an accumulation of solid matter above the desired optimum value until such time as the accumulation of solid matter returns to the desired optimum accumulation of solid matter.

4,085,889

CENTRIFUGE HAVING SEPARABLE CENTRIFUGE VESSEL

Richard Steimel, Frankfurter Strasse 134, 5202 Hennef, Sieg, Germany

Filed Nov. 5, 1976, Ser. No. 739,339
Int. Cl.[2] B04B *9/02, 7/04, 15/06*
U.S. Cl. 233—20 R **10 Claims**



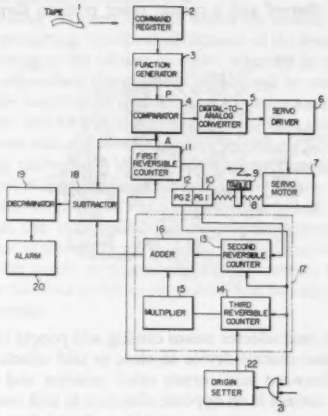
1. A centrifuge comprising:
a support;
an upright shaft;
bearing for mounting said shaft on said support rotatably about an upright axis, for preventing said shaft from moving axially, and for permitting limited horizontal displacement of said shaft relative to said support;
a floor member fixed to said shaft and having a downwardly flared support surface;
an annular wall member having a downwardly flared support surface supportable on said surface of said floor member, said wall member having at least one radially open hold and being provided below said hole with a radially outwardly extending flange;
a trough surrounding said wall member below said flange;
a lift ring surrounding said wall member below said flange; and
means for raising said lift ring into engagement with said flange for lifting said wall member off said floor member and for lowering said lift ring to set said wall member with its surface on said surface of said floor member.

4,085,890

POSITION DETECTING SYSTEM

Toshihiro Kimura, Nagoya; Yoshimaro Hanaki, Kasugai, and Humio Nomura, Komaki, all of Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Jul. 15, 1976, Ser. No. 705,567
Claims priority, application Japan, Feb. 20, 1976, 51-18380
Int. Cl.[2] G06F *7/02;* **G05B** *19/24;* **G06F** *15/46, 7/38*
U.S. Cl. 235—419 **3 Claims**



1. In a position-detecting system for a machine, including a moving amount detection pulse generator for incrementally detecting the position of a moving part of the machine; the improvement comprising a reference point detection pulse generator for determining reference points providing predetermined reference distances within the control range of the moving part, means for numerically calculating the position of said moving part on the basis of the output of said reference point detection pulse generator and said moving amount detection pulse generator, means for comparing the position of said moving part based on the output of said moving amount detection pulse generator with the position of said moving part based on the output of said moving part position calculator means, and means for issuing an alarm when the positions based on the outputs of said moving amount detection pulse generator and said moving part position calculator means fail to coincide with each other.

4,085,891

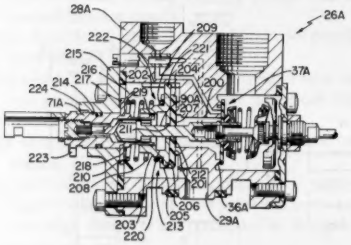
FUEL CONTROL SYSTEM AND CONTROL DEVICE THEREFOR OR THE LIKE

Charles D. Branson, and Roy C. Demi, both of Greensburg, Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 570,863, Apr. 23, 1975, Pat. No. 4,007,672, which is a division of Ser. No. 530,605, Dec. 9, 1974, Pat. No. 3,989,064, which is a continuation-in-part of Ser. No. 443,783, Feb. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 380,389, Jul. 18, 1973, abandoned. This application Nov. 18, 1976, Ser. No. 742,846
Int. Cl.[2] F23N *1/00*
U.S. Cl. 236—15 A **2 Claims**

1. In a fuel control system for a fuel burning apparatus or the like having a source of fuel adapted to be interconnected by passage defining means to burner means of said apparatus, a pair of control devices disposed in said passage defining means in series relation and respectively having poppet valve means for opening and closing said passage defining means, said poppet valve means of one of said control devices being a main directly manually operated "on-off" valve means for said system, said one control device having a thermostatically operated valve means for controlling the flow of fuel through

said passage defining means intermediate said poppet valve means, said one control device having a movable selector means for setting said thermostatically operated valve means whereby said thermostatically operated valve means will tend to maintain the output temperature effect of said burner means at the temperature setting of said selector means, said poppet valve means of said one control device being operatively associated with said selector means to be moved to an open position thereof as said selector means is moved between an "off" position thereof and a certain other position thereof in one



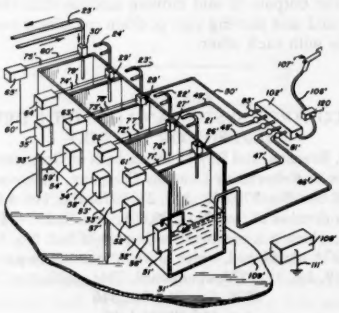
direction, said selector means causing said poppet valve means of said one control device to close as said selector means is moved between said certain other position and said "off" position thereof in an opposite direction to said one direction, said selector means being rotatable and including a rotatable shaft means, the improvement wherein said poppet valve means of said one control device is moved axially along the axis of rotation of said shaft means as said shaft means is being rotated to open or close said poppet valve means of said one control device.

4,085,892

CONTINUOUSLY ENERGIZED ELECTROSTATIC COATING VOLTAGE BLOCK

Robert E. Dalton, 859 E. 169th St., South Holland, Ill. 60473

Filed Apr. 21, 1976, Ser. No. 678,862
Int. Cl.² B05B *5/02*
U.S. Cl. 239—15 **9 Claims**



1. In an electrostatic coating system having a spray gun for ejecting highly electrically conductive coating material and an electrode charged to high voltage adjacent the location of ejection of the coating material from the spray gun having a high voltage power supply, and having a coating material supply system supplying coating material to the gun, wherein the improvement comprises,

a first sub-system in said coating material supply system containing coating material electrically grounded,

a second sub-system in said coating material supply system containing coating material insulated from electrical ground and connected to said high voltage power supply,

means for periodically ejecting predetermined masses of coating material into the atmosphere forming a portion of said first sub-system, and

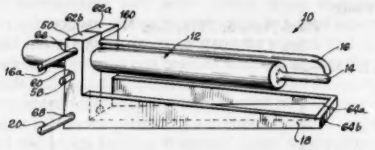
means forming a portion of said second sub-system for periodically receiving said predetermined masses of coating material ejected across a predetermined air space, said air space having a sufficiently large predetermined dimension between said first and second means and said masses of coating material being of a relatively small predetermined size to prevent arcing in said air space when said second system is charged to a high voltage by said high voltage power supply.

4,085,893

ULTRASONIC HUMIDIFIERS, ATOMIZERS AND THE LIKE

Benton A. Durley, III, Rte. 45, Druce Lake, P.O. Box 304, Grayslake, Ill. 60030

Continuation-in-part of Ser. No. 525,487, Mar. 20, 1974, abandoned. This application Sep. 3, 1976, Ser. No. 720,431
Int. Cl.² B05B *17/06*
U.S. Cl. 239—102 **11 Claims**



1. An ultrasonic device for atomizing a liquid,

comprising a front end mass,

a tail mass,

a pair of piezoelectric elements secured between said front end mass and said tail mass for imparting ultrasonic vibrations thereto,

an electrode secured between said piezoelectric elements,

a mounting member having an opening therein receiving said piezoelectric elements and portions of said masses,

said mounting member affording electrical insulation around said piezoelectric elements and said electrode,

said front end mass having a reduced end portion constituting a vibratory member,

a liquid supply conduit mounted on said mounting member and extending to a point adjacent and above said vibratory member for delivering a liquid into contact with said vibratory member,

and a collection receptacle mounted on said mounting member and disposed beneath said vibratory member for collecting any excess liquid draining from said vibratory member.

4,085,894

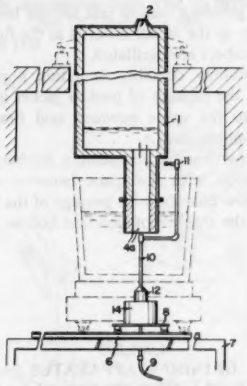
APPARATUS FOR AUTOMATICALLY REPAIRING THE LINING OF A FURNACE

Sueki Kubo, Kitakyushu; Katsuya Toso, Ashiya, and Masayuki Fujita, Kitakyushu, all of Japan, assignors to Kurosaki Refractories Co., Ltd., Fukuoka, Japan

Filed May 28, 1976, Ser. No. 691,111
Claims priority, application Japan, Jun. 24, 1975, 50-79104
Int. Cl.² B05B *13/06*
U.S. Cl. 239—121 **13 Claims**

1. Apparatus for automatically repairing the lining of a furnace comprising a transport car movable on a floor, a turntable rotatably mounted on said transport car and rotatable about a first vertical axis, movable car means carried on said transport car, a vertically disposed spray means mounted on said car means and operable to spray a refractory material onto

the lining of said furnace, said vertically disposed spray means being rotatable about a second vertical axis eccentrically displaced from said first vertical axis such that rotation of said turntable about its first vertical axis will cause said vertically disposed spray means to revolve about said first vertical axis, elevating means on said car means for raising and lowering said



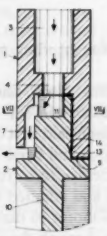
spray means as the latter sprays said refractory material, and rotatable means on said car means for rotating said spray means as the latter sprays said refractory material, whereby said spray means is capable of automatically spraying refractory material onto the various areas of the lining on the interior of said furnace.

4,085,895

ADJUSTABLE SPRAY DEVICE

Byron V. Curry, 1150 Oriole Rd., Montecito, and Michael G. Walton, P.O. Box 5638, Santa Barbara, both of Calif. 93108

Filed Mar. 25, 1977, Ser. No. 781,138
Int. Cl.[2] A62C 31/22
U.S. Cl. 239—276 **16 Claims**



1. An adjustable spray device for receiving liquid under pressure and emitting a spray of a volume determined by the adjustment of the device, the device comprising:

a tubular member including an internal channel of generally circular cross-section, the channel having an inlet portion and an outlet portion,

a cylindrical insert member received in the outlet portion of the internal channel of the tubular member, the insert member including a flared head seating against one end of the tubular member,

the insert member further including a chamber formed in the end received within the tubular member, the chamber being in fluid communication with the inlet portion of the internal channel within the tubular member,

an orifice between the chamber and the internal channel of the outlet portion of the tubular member, the orifice being defined by an opening in the side wall of the insert member, the remainder of the side wall of the insert member being sufficiently flexible to be distended by the pressure of liquid within the chamber into a sealing engagement with the interior side wall of the tubular member,

the tubular member also including a longitudinal channel in its side wall extending laterally from an inlet portion adjacent the chamber to an outlet portion adjacent the flared head of the insert member,

an aperture for liquid being provided adjacent the junction of the longitudinal channel in the tubular member and the head of the insert member, and

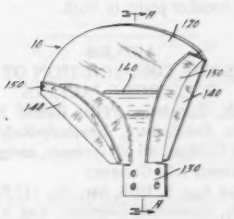
means holding the insert member within the tubular member while permitting rotational adjustment of the insert member relative to the tubular member, whereby in one rotational adjustment the chamber orifice will be misaligned with the longitudinal channel in the tubular member and the side wall of the chamber distended into sealing engagement with the tubular member to prevent liquid from flowing through the device, while in another rotational adjustment the orifice will be at least partially aligned with the longitudinal channel to permit liquid to flow through the inlet portion of the tubular member, the chamber in the insert member and the longitudinal channel in the outlet portion of the tubular member to strike against the head of the insert member and be emitted from the aperture.

4,085,896

APPARATUS AND SPRAY HEAD FOR FLUID DISPERSION

Robert Dorsch, and Daryl Leach, both of Warren, Mich., assignors to Alpha-Debon Industries, Inc., Troy, Mich.

Filed Dec. 6, 1976, Ser. No. 747,510
Int. Cl.[2] B05B 1/26
U.S. Cl. 239—504 **5 Claims**



1. An apparatus for removing particulate matter from air wherein contaminated air containing undesirable particulate matter is passed through a fluid spray whereupon said air is scrubbed to remove substantially all of the undesirable particulate matter, wherein said fluid spray is produced upon the impact of pressurized fluid with the surface of a spray head comprising a rigid bent spray plate with two rigid head side plates attached thereto, and two rigid spray side guide bars attached to each of said side plates, wherein said spray plate is bent in a radius of from about 2 inches to about 6 inches to form an angle of between about 95° to about 155°, and wherein said spray plate flares out beyond the bent portion extending through an angle of between about 60° to about 120°.

4,085,897

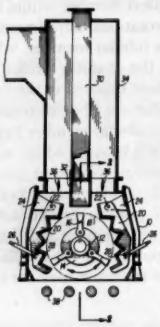
CRUSHER-DRYER AND METHOD OF CRUSHING

William F. Hahn, Devon; Joseph P. Nigro, Villanova, and Frank Wallitsch, Jr., Center Valley, all of Pa., assignors to Pennsylvania Crusher Corporation, Broomall, Pa.

Continuation of Ser. No. 746,379, Dec. 1, 1976, abandoned. This application Jul. 18, 1977, Ser. No. 816,828

Int. Cl.[2] B02C *23/24*

U.S. Cl. 241—18 **11 Claims**



10. A method of crushing and drying moist materials such as coal and other materials, comprising the steps of:

causing said material to drop through a first essentially vertically oriented duct;

causing said material to leave said first duct at a short distance above the impact circle defined by the outer extremities of the impact members of a crushing machine having a housing, a rotor mounted for rotation on an axis in said housing, impact members mounted on said rotor for striking and crushing material falling through said impact circle and at least one breaker plate mounted in said housing in position to be impacted by material thrown off by said impact members;

passing a flow of hot air into said crushing machine in parallel with said material through at least one second duct spaced outboard of said first duct on the down-running side of said rotor; and

selectively directing said flow of hot air through said crushing machine and between said breaker plate and said rotor; behind said breaker plate; or both.

4,085,898

APPARATUS FOR COMMINUTION OF WELDING ELECTRODE JACKETS

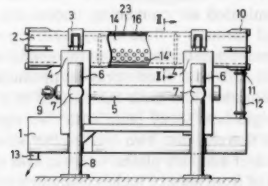
Dieter Jacubasch, Eisenberg, Pfalz; Rudolf Eisenhauer, Cologne; Jüergen Greifenberg, Bensberg-Refrath, and Rolf-Dieter Goebel, Cologne, all of Germany, assignors to Klockner-Humboldt-Deutz AG, Germany

Filed Aug. 9, 1976, Ser. No. 712,942

Claims priority, application Germany, Aug. 9, 1975, 2535711

Int. Cl.[2] B02C *17/08*

U.S. Cl. 241—175 **6 Claims**



1. Apparatus for comminuting the jacket material carried on jacket support rods, comprising: a first hollow chamber;

oscillating means connected to said first hollow chamber for oscillating said first hollow chamber;

a second hollow chamber for receiving the jacketed rods, said second hollow chamber removably mounted within and spaced from the inner surface of said first hollow chamber; and

a plurality of grinding rods in said second hollow chamber for breaking up the jacket material as the first and second hollow chambers are oscillated,

said second hollow chamber including a perforate wall portion for the passage of broken jacket material therethrough into the space between said first and second hollow chambers, and

said first hollow chamber including a discharge opening in communication with the space between said first and second hollow chambers for passage of the broken jacket material to the exterior of said first hollow chamber.

4,085,899

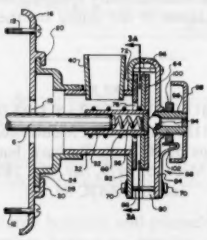
GRINDING APPARATUS

Leland Harman Boothe, 251 S. 600 East, Alpine, Utah 84003

Filed Nov. 22, 1976, Ser. No. 743,862

Int. Cl.[2] B02C *7/13, 7/14*

U.S. Cl. 241—247 **15 Claims**



1. Grinding apparatus for grinding grain and the like comprising

first and second grinding discs, said first disc having an opening centrally located therein

support structure on which said first disc is fixedly mounted,

a support shaft having one end fixed to said second disc and extending from the center of a front side of said second disc, normal thereto, and adapted for mounting coaxially on the drive shaft of a motor so that when so mounted, the support shaft extends through the opening in the first disc to support the second disc in a generally coaxial, mutually facing relationship with the first disc, said second disc being rotatable as the motor drive shaft is rotated,

biasing means disposed in contact with the motor drive shaft and said support shaft for biasing the support shaft and second disc in a direction outwardly from the end of the motor drive shaft,

a bearing element disposed on a back side of said second disc opposite the front side thereof, said bearing element defining a bearing surface,

a cover mounted on said support structure to fit substantially over and about said discs, and

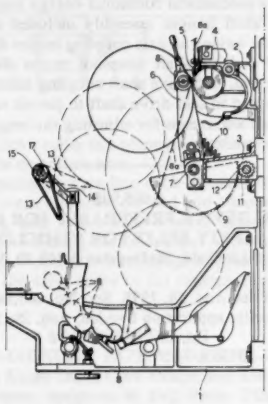
a bearing member disposed in said cover for contacting and pressing against said bearing surface of the bearing element to thereby maintain the support shaft on the motor drive shaft, said bearing member including a ball means loosely held by said cover to protrude from said cover and contact and press against said bearing surface of the bearing element.

4,085,900

BOBBIN-CHANGING DEVICE WITH AUTOMATIC MEANS FOR SEVERING THE THREAD OR STRIP

Pietro Marcio', Arese (Milan), Italy, assignor to Sant' Andrea Novara Officine Meccaniche e Fonderie S.p.A., Novara, Italy

Filed Sep. 28, 1976, Ser. No. 727,565
Claims priority, application Italy, Oct. 3, 1975, 69458 A/75
Int. Cl.[2] B65H *54/46*
U.S. Cl. 242—18 DD **6 Claims**



1. A textile winding machine for winding an elongate filamentary member composed of textile fibres, the machine comprising:

means for rotatably supporting a rotary winding member for receiving the filamentary member;

means for rotating the rotary winding member in a wind-on direction and while in a winding zone, to wind the filamentary member thereon;

guide means for guiding the filamentary member to a part of the periphery of the rotary winding member which descends during rotation of the rotary winding member in the wind-on direction;

means for allowing the fully wound rotary winding member to descend from its winding zone and follow a descent path; and

a frictional member in the descent path and on the side of the axis of the rotary winding member towards which the bottom part of the rotary winding member rotates in the wind-on direction, whereby the frictional member is engaged by the periphery of the fully wound rotary winding member to accelerate the winding member in the wind-on direction thereby breaking the filamentary member.

4,085,901

APPARATUS FOR PACKAGING LINEAR MATERIAL

James E. Sanders, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

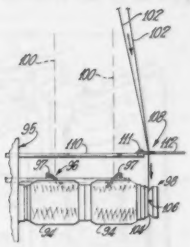
Continuation of Ser. No. 590,756, Jun. 26, 1975, abandoned.
This application May 27, 1977, Ser. No. 801,191
Int. Cl.[2] B65H *54/00*
U.S. Cl. 242—18 G **5 Claims**

1. Apparatus for packaging a first and a second supplied strand comprising:

a. a rotatable collet having a first package collection region for collecting the first strand, a second package collection region for collecting the second strand and a temporary collection region;

b. a strand engaging member having a recess and a guide surface terminating at one end at the recess; and

c. means for moving the member so that the strands can be moved along the collet between the package collection regions and the temporary collection region, the guide surface being disposed to first contact and laterally guide the first strand toward the recess and then contact and laterally guide the second strand toward the recess so that both strands are collected in the recess and are gathered into a single bundle therein when the member is moved along a path to move each strand from its respective



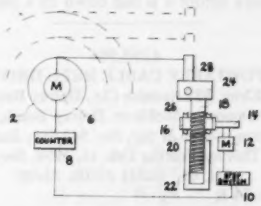
package collection region to the temporary collection region, the recess being disposed tending to hold the single bundle therein and thus urge movement of the bundle of the strands with it when the member is moved back along the path such that each strand individually releases from the recess at its package collection region.

4,085,902

STRAIGHT HOLE FORMATION WITH MOVING GUIDE PATH

William A. Wagner, Somers, N.Y., assignor to Windings, Inc., Goldens Bridge, N.Y.

Continuation of Ser. No. 690,882, May 28, 1976, abandoned.
This application Apr. 14, 1977, Ser. No. 787,304
Int. Cl.[2] B65H *54/28, 55/02*
U.S. Cl. 242—43 R **2 Claims**



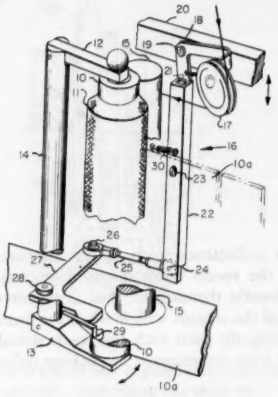
1. In a machine for winding flexible material into a package comprising a rotatably driven spindle, a movable material guide, means to reciprocate the guide along the spindle so as to lay upon the spindle successive layers of figure-8 windings in which the crossovers progress angularly around the package in each layer, and means to change the relative movement between the spindle and guide so as to produce in each layer of the windings a hole therethrough, the improvement comprising, means to shift the reciprocating travel path of the guide progressively with respect to the spindle in synchronism with the rotation of the spindle so as to maintain a line joining the reciprocating travel path of the guide to the surface of the material wound on the spindle at all times tangent to such surface in the same spatially fixed line radial to the axis of rotation of the spindle, whereby the holes in the layers of the windings are radially aligned to form a straight hole radially of the package.

4,085,903

YARN WINDING APPARATUS

Klaus Dieter Kuhnemann, Kingston, Canada, assignor to Du Pont of Canada Ltd., Montreal, Canada

Filed Sep. 9, 1976, Ser. No. 721,767
Claims priority, application Canada, Nov. 12, 1975, 239616
Int. Cl.[2] B65H *57/28*
U.S. Cl. 242—43.1 **2 Claims**



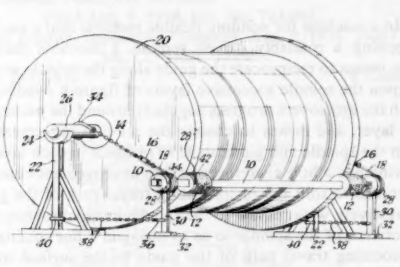
1. A yarn winding apparatus comprising:
a frame;
a driven friction roller rotatably mounted to said frame in a vertical position;
a rotatable package in surface contact with said roller;
a layrail horizontally positioned in close proximity to said friction roller; means for reciprocating the layrail longitudinally of the package;
a modulating yarn guide means for imparting vibratory motion to the yarn; and means connected between said modulating yarn guide and said layrail for traversing said modulating yarn guide means the length of said package; so that the modulating yarn guide imparts a vibratory motion to the yarn throughout the length of the package immediately before it is laid down on a package.

4,085,904

PORTABLE CABLE REEL DRIVE

James A. McElroy, 951 Spanish Cir., Delray Beach, Fla. 33444, assignor to James A. McElroy, Delray Beach, Fla.

Continuation-in-part of Ser. No. 542,550, Jan. 20, 1975, abandoned. This application Feb. 11, 1976, Ser. No. 657,229
Int. Cl.[2] B65H *49/00, 75/00*
U.S. Cl. 242—54 R **3 Claims**



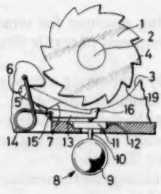
1. A portable cable reel drive for rotating a cable reel having a hub and mounted on an axle and an axle support comprising:
a drive shaft;
at least one reel drive hub connected to said drive shaft;
a drive shaft hanger assembly rotatably coupled to said drive shaft at one end and coupleable to said cable reel axle;
said drive shaft hanger assembly mounting said drive shaft in proximity to said reel hub for engaging said reel drive hub with said reel hub;
a detachable drive shaft stabilizing means for securing said drive shaft in a fixed position relative to said reel and said stabilizing means connected to said drive shaft and said axle support; and
means connected to said drive shaft for coupling said drive shaft to a mechanical rotational energy source;
said drive shaft hanger assembly includes a first flexible connector, having an axle coupling means disposed at one end and a drive shaft coupling means disposed at the opposite end, said drive shaft coupling means being rotatably coupled to said drive shaft to permit rotation of said drive shaft and means for adjusting the length of said first flexible connector.

4,085,905

BLOCKING DEVICE PREFERABLY FOR REEL-TYPE SAFETY BELTS FOR VEHICLES

Oskar Lennart Lindbald, Hedasgatan 6 440 20, Vargarda, Sweden

Filed Aug. 18, 1975, Ser. No. 605,348
Claims priority, application Sweden, Aug. 29, 1974, 7410929
Int. Cl.[2] B65H *75/48*
U.S. Cl. 242—107.4 A **11 Claims**



1. Blocking device for vehicle reel-type safety belts comprising a rotatably mounted ratchet wheel having teeth and capable of being connected to the reels of the safety belts, a pivotally mounted blocking pawl positioned for at times engaging the teeth of said ratchet wheel for preventing rotation of said ratchet wheel in one direction, actuating means being operable upon an abnormal change of speed of the vehicle, a pivotally mounted auxiliary pawl being postioned for being pivoted by said actuating means into engagement with said teeth and pivoting said blocking pawl into engagement with said teeth upon actuation of said actuating means, and resilient means tending to retain said auxiliary pawl into engagement with said actuating means.

4,085,906

MAGNETIC TAPE CARTRIDGE TRANSPORT

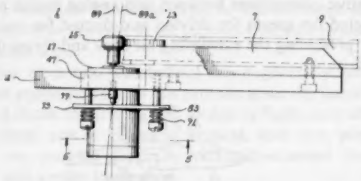
John Conlan Dahl, and David Lee Barnett, both of Phoenix, Ariz., assignors to Three Phoenix Company, Phoenix, Ariz.

Filed Dec. 13, 1976, Ser. No. 749,838
Int. Cl.[2] G11B *15/32;* **B65H** *17/24*
U.S. Cl. 242—192 **10 Claims**

1. In a magnetic tape cartridge transport for transporting magnetic tape enclosed in a cartridge having capstan means accessible through a front edge thereof for receiving rotary motion from a drive roller coupled to an electric motor which passes through a motor opening in a base plate of the transport, the improvement comprising:
(a) an attachment bracket secured to the motor and extending laterally therefrom and having first, second and third apertures therein;
(b) first, second and third downwardly extending shafts

positioned in spaced relationship about the motor opening of the base plate and secured to the base plate, said first, second and third shafts protruding respectively through the first, second and third apertures in said attachment bracket and including shoulders on the lower ends thereof;

(c) pivot means for permitting said attachment bracket to



pivot the drive roller in a plane perpendicular to the front edge of the cartridge; and

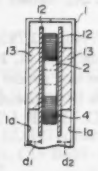
(d) biasing means surrounding each of said shafts and positioned between said shoulder and said attachment bracket for biasing said attachment bracket against said pivot means and for biasing the drive roller of the motor against the capstan means of the cartridge to transfer rotary motion from the drive roller to the capstan means.

4,085,907

MAGNETIC TAPE MAGAZINE

Osamu Suzuki; Kengo Oishi; Goro Akashi, and Kenji Sega, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Continuation of Ser. No. 685,900, May 12, 1976, abandoned.
This application Mar. 14, 1977, Ser. No. 777,536
Claims priority, application Japan, May 12, 1975, 50-56553
Int. Cl.² G11B *23/10*
U.S. Cl. 242—199 **4 Claims**



1. A magnetic tape magazine comprising a casing, a tape feed-out core, a tape take-up core, a magnetic tape wound in convolutions on said feed-out and take-up cores, and a pair of friction sheets interposed between the tape convolutions and inner walls of the casing wherein the improvement comprises a pair of cushion sheets made of elastic material interposed between said friction sheets and the inner walls of the tape magazine, said cushion sheets each having a thickness larger than the space between the side faces of the tape convolutions and the inner wall of the tape magazine, the thickness being so selected that the pressure imparted on the side faces of the tape convolutions is 0.1 to 0.69g/cm².

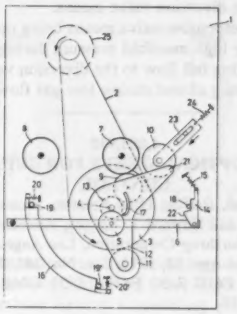
4,085,908

TAPE RECORDER CONTROL UNIT

Reinhold Emmert, Furth, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Furth, Germany

Filed Oct. 18, 1976, Ser. No. 733,030
Claims priority, application Germany, Dec. 19, 1975, 2557319
Int. Cl.² G11B *15/10, 15/29, 15/30*
U.S. Cl. 242—201 **10 Claims**

1. In a cassette type tape recorder of the type having: "start", "stop" and "rewind" modes of operation, a d.c. drive motor, means for altering the polarity of the voltage applied to said drive motor, a tape transport shaft driven by said drive motor, a fly wheel mounted concentrically about said shaft, a pressure roller lever, a pressure roller mounted for rotation on said lever and adapted to engage a length of tape to hold said tape in operational engagement with said shaft, a tape take-up reel driver, a tape supply reel driver and idler means mounted to be driven through said flywheel and to be coupled to the reel



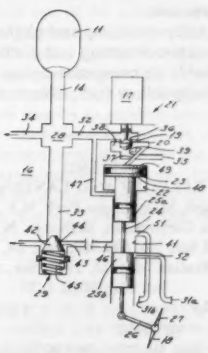
drivers; the improvement comprising: a swing arm rotatably mounted about said shaft, clutch means for frictionally connecting said swing arm to said fly wheel, said idler means being mounted to said swing arm for movement therewith whereby reversal of the direction of said drive motor causes said swing arm to rotate from a first position wherein said idler means engages one of said drivers to a second position wherein said idler means engages the other of said drivers.

4,085,909

COMBINED WARM GAS FIN AND REACTION CONTROL SERVO

George F. East, Whittier, and Charles E. Hallum, Irvine, both of Calif., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 4, 1976, Ser. No. 729,512
Int. Cl.² F42B *15/16, 15/18*
U.S. Cl. 244—3.21 **14 Claims**



1. A reaction nozzle and movable fin servo system for providing reaction and fin directional control of a missile during low and high velocity flight phases, comprising:

a gas generator having a stepped flow rate that is high shortly after ignition and low during sustaining operation,

a plurality of independent actuator means each coupled to a movable fin for controlling the aerodynamic lift orientation of the latter,

a control valve means for controlling gas flow to each actuator means,

each actuator means including diversion valve means for controlling gas flow to reaction nozzles,

a manifold having flow passages to duct gas from the gas generator to each control valve means and each diversion valve means,

and a pressure responsive valve means controlling the gas flow through the flow passages connecting the gas generator and the diversion valve means,

the pressure responsive valve means being open in response to relatively high manifold pressure during high gas flow rate permitting full flow to the diversion valve means and normally being closed during low gas flow rate.

4,085,910

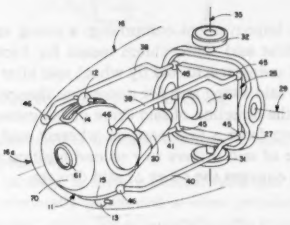
DUAL MODE OPTICAL SEEKER FOR GUIDED MISSILE CONTROL

William G. Baker, Rolling Hills Estates; James H. Gisbrecht, Rolling Hills, and Edward T. Luszcz, Anaheim, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed Apr. 12, 1972, Ser. No. 243,280

Int. Cl.[2] F41G *7/00*; F42B *15/02*; G06F *15/50*

U.S. Cl. 244—3.16 **8 Claims**



1. In a dual mode optical seeker having an optical assembly comprising optical units for separately sensing visible signals and infra-red signals, said optical assembly being mounted for pivotal motion about azimuth and elevation axes, the improvement comprising means for inertially stabilizing said optical assembly without mounting said assembly on a stable platform, said improvement including:

a stable platform unit,

means for inertially stabilizing said platform unit, and

rod means for interconnecting said platform unit with said optical assembly to cause said optical assembly to precisely physically follow said platform unit in azimuth and elevation.

4,085,911

VERTICAL TAKEOFF AND LANDING AIRCRAFT

Richard J. Nahodyl, Massapequa Park, N.Y., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 699,388, Jun. 24, 1976, abandoned. This application May 23, 1977, Ser. No. 799,510

Int. Cl.[2] B64C *1/30*

U.S. Cl. 244—12.4 **1 Claim**

1. An aircraft comprising:

a fuselage having air inlet means for a cavity having an opening at the rear thereof;

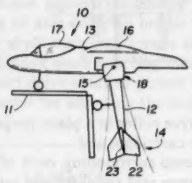
wings fixed to said fuselage and extending from an upper portion of said fuselage on each side thereof;

a separate longitudinal supporting structure carrying a tail assembly including movable aerodynamic control surfaces at one end thereof, said surfaces being elevon and rudder surfaces located on each side of said fuselage and beneath said fuselage;

an engine means submerged in the cavity of said fuselage between said air inlet means and said opening which forms an exhaust port for said engine means;

a plurality of ducted fan means attached to said longitudinal supporting structure, at least one of said ducted fan means on each side of said fuselage, said ducted fan means being under said wings and exhausting air flow over and about said aerodynamic control surfaces under said fuselage;

operative connections between said engine means and said ducted fan means for driving said ducted fan means and for producing the exhausting air flow and thrust thereby; and



means to pivot said longitudinal supporting structure under and away from said fuselage whereby said longitudinal supporting structure will pivot said ducted fan means about an axis transverse to said fuselage to a position substantially normal to and under said wings to change the direction of thrust produced by said fan means, and whereby said aerodynamic control surfaces remain immersed in the slipstream from said ducted fan means at all positions of said longitudinal supporting structure to effect yaw, roll and pitch movements of said aircraft upon displacement of said aerodynamic control surfaces.

4,085,912

CONVERTIBLE AIRSHIP

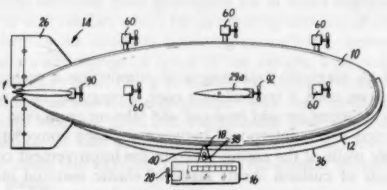
Saul I. Slater, 1427 W. 22 St., Sunset Island 4, Miami Beach, Fla. 33140

Continuation-in-part of Ser. No. 552,793, Feb. 25, 1975, Pat. No. 3,971,533. This application Apr. 14, 1976, Ser. No. 674,278

The portion of the term of this patent subsequent to Jul. 27, 1993, has been disclaimed.

Int. Cl.[2] B64B *1/38*

U.S. Cl. 244—25 **53 Claims**



1. An airship convertible between a generally horizontal configuration and a generally vertical configuration, comprising:

a generally elongate outer envelope structure adapted to house a lighter-than-air gas and any enclosure means used for containing the gas;

a gondola adapted to be mounted to said envelope structure;

means for generally slidably mounting said gondola to said envelope structure to enable rotation of the longitudinal axis of said envelope structure between generally horizontal and generally vertical orientations while said gondola maintains a generally horizontal orientation by variably positioning said gondola generally along said envelope structure from a point generally under said envelope structure when its longitudinal axis is generally horizontal to a point generally at the nose of the envelope structure when its longitudinal axis is generally vertical;

means for variably positioning said gondola relative to said envelope structure;

stabilizer means mounted to said envelope structure, said stabilizer means being operable from said gondola to assist controlling said airship during flight and maneuvering; and

first propulsion means mounted to said envelope structure adapted to provide thrust generally parallel to said longitudinal axis,

such that when said longitudinal axis is generally horizontal, said first propulsion means can provide generally horizontally-oriented thrust for driving said airship in flight, and when said longitudinal axis is generally vertical, said first propulsion means can provide generally vertically-oriented thrust for urging said airship to descend.

44. A method for anchoring an airship containing a lighter-than-air gas, which is convertible between generally horizontal and generally vertical configurations, comprising the steps of:

ceasing generally all generally horizontally directed propulsion;

generally slidably moving the airship gondola to a point generally at the nose of the airship envelope structure for orienting the longitudinal axis of the airship envelope structure to a generally vertical orientation while maintaining the gondola in a generally horizontal orientation;

propelling the airship downwardly;

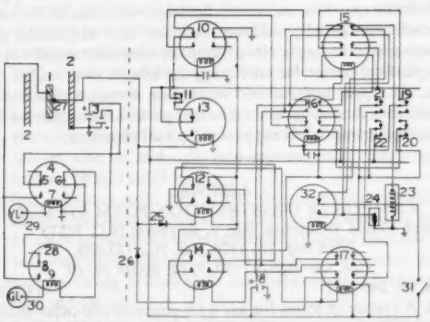
positioning magnet means attached to the gondola in position for attraction to a magnetically attractive member secured to the earth; and

allowing the magnet means and the magnetically attractive member to become coupled by magnetic attraction therebetween.

4,085,913
DEVICE FOR PREVENTING COLLISION OF TRAINS

Chen-Kun Chang, 3733 Quintara St., San Francisco, Calif. 94116

Filed Jan. 12, 1977, Ser. No. 758,560
Int. Cl.[2] B61L *1/08*
U.S. Cl. 246—63 A 5 Claims

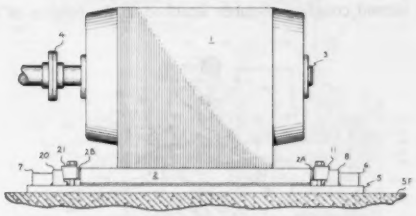


1. A railway automatic signal sending unit from a wayside to a locomotive, consisting of two relays, two storage batteries, a stationary wayside contact, a yellow traffic light, a green traffic light, and electric circuits, wired such that when the yellow traffic light is on, a D. C. voltage on the stationary wayside contact is positive, when the green traffic light is on, the D. C. voltage on the stationary wayside contact is negative, and when neither the yellow nor green traffic light is on, the D. C. voltage on the stationary wayside contact is zero.

4,085,914
DYNAMOELECTRIC MACHINE MOUNTING ASSEMBLY

John J. Gavin, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,351
Int. Cl.[2] F16M *5/00*
U.S. Cl. 248—19 5 Claims



1. A dynamoelectric machine mounting assembly comprising a foundation soleplate having a flat upper surface, a dynamoelectric machine having a mounting pedestal with two substantially parallel planar sides, said pedestal being slidably disposed on said upper surface of said plate, first and second holding blocks welded to the upper surface of the foundation soleplate each, respectively, on opposite sides of said pedestal adjacent one of said planar sides, at least one cam block welded to said upper surface in abutting relationship with one of said holding blocks, between it and said pedestal, said cam block having a cam surface beveled at an angle in the range of 65° to 85° relative to said flat upper surface, a wedge bar positioned between the cam block and said pedestal, said wedge bar having a planar surface juxtaposed with the nearest planar side of said pedestal and having a beveled surface positioned in sliding relationship on the beveled cam surface of said cam block, the beveled surfaces of said wedge bar and cam block being approximately equal in length to the length of the planar side of the pedestal adjacent thereto, first wall means defining a plurality of spaced apertures extending through the wedge bar from the top to the bottom surface thereof, second wall means defining a plurality of threaded apertures extending through the upper surface of said foundation soleplate into the body thereof, and a plurality of threaded bolts each positioned, respectively, through one of the apertures in said wedge bar and into threaded engagement with one of the apertures in said sole plate, said bolts being operable, responsive to rotation thereof that forces their heads against the top of the wedge bar, to drive the beveled surface of the wedge bar against said beveled cam surface thereby to position one planar surface of the pedestal against the other holding block and to stress-load the wedge bar by compressing it between the pedestal and the cam block, said stress-loaded wedge bar being effective to retain the pedestal in a fixed position when the pedestal is subjected to thrust loading along an axis transverse to the planar sides thereof.

4,085,915
COUPLING DEVICE FOR EQUIPPING A CAMERA ONTO THE TRIPOD

Kyong Jin Song; Yong Shik Song; Jong Shik Song, and Jung Shik Song, all of 57-1, Kyongwon-dong 1-ka, Jonju, North Korea

Filed Jan. 11, 1977, Ser. No. 758,550
Int. Cl.[2] F16M *11/04*
U.S. Cl. 248—187 3 Claims

1. A coupling device for attaching a camera to a tripod, said device comprising:

a first coupling member attached on the underneath side thereof to the top of said tripod;

a hollow upright member on the top, central portion of said

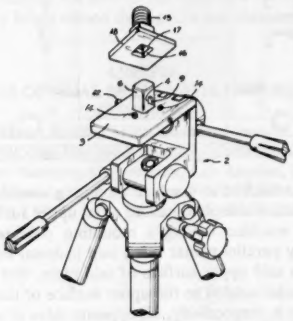
first coupling member, said hollow member having a hole through at least one upright side wall thereof;

a hook member pivotally mounted in said hollow member and extending through said hole in the side thereof;

push means within said first coupling plate adjacent said hook member for pushing against said hook member and causing said hook member to pivot;

first spring means on the side of said hook member opposite said push means for biasing said hook member against said push means;

a second coupling member attached to the bottom of said



camera, said second coupling member having a screw portion at the top thereof threaded into said camera and an open cavity in the bottom thereof beneath said screw portion and inserted over said hollow upright member, and said second coupling further having inside said cavity at least one locking groove engageable with said hook member;

at least one rubber packing member slidably extending upward from said first coupling member beneath said second coupling member; and

second spring means beneath said rubber packing for urging said packing upward.

4,085,916

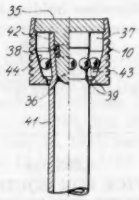
RELEASABLE LOCKING DEVICE

Jorgen Gammelgaard Pedersen, Vaegtens Kvarter 4B, DK-2620 Albertslund, Denmark

Continuation-in-part of Ser. No. 448,636, Mar. 6, 1974, abandoned. This application Nov. 13, 1975, Ser. No. 631,664

Int. Cl.[2] F16M *11/16*

U.S. Cl. 248—188 **13 Claims**



1. A releasable locking device comprising in combination:

a first socket-like member having a recess and a separate second member having a projecting portion, said members being relatively movable substantially in the axial direction of said projecting portion into and out of a mutually fully engaged position in which said projecting portion of said second member is received in said recess in said first member, said first member having a stud portion arranged centrally within said recess and extending towards the opening thereof and said projecting portion of said second member having at its free end a pocket or bore for receiving said stud member in the fully engaged position of said first and second members and having an outer surface part diverging towards the free end of said projecting portion and defining together with a radially oppositely located inner wall part of said recess of said first member an annular channel section having a radial width decreasing in the direction towards the opening of the recess in said first member from a maximum width to a minimum width,

at least one latch element arranged within said channel section, the maximum radial dimension of the latch element receivable in said channel section being greater than said minimum width and smaller than said maximum width of the channel section, said latch element being freely movable in said channel section between locking and releasing positions in which said members are locked by said latch element in their fully engaged position and in which said members may be disengaged, respectively, said latch element being movable from its releasing position to its locking position and vice versa exclusively by its own weight, whereby said members may be disengaged only in certain positions of the locking device.

4,085,917

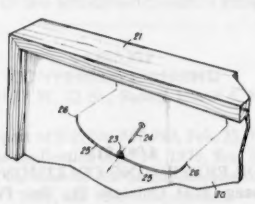
PICTURE HANGER

Haskew H. Brantley, Jr., 6114 Riverside Dr. NW., Atlanta, Ga. 30328

Continuation-in-part of Ser. No. 599,928, Jul. 29, 1975. This application Jun. 21, 1976, Ser. No. 697,875

Int. Cl.[2] A47G *1/24*

U.S. Cl. 248—489 **9 Claims**



1. A hanger for pictures and the like comprising an elongated wire body having diverging arms for engaging the wall throughout substantial portions of their lengths and upstanding suspension elements on the ends of said arms on which a picture frame may rest, and means between said arms on the body portion substantially midway between said suspension elements and including a closed loop element substantially at its longitudinal center for anchoring the hanger to a wall or the like, the upper ends of said suspension elements terminating above said loop element so that said picture frame may be flat against the wall when supported by said elements.

4,085,918

COMPOSITE CONSTRUCTION FORM SYSTEM

Joseph Felton Wilkerson, Rte. 2, Roxboro, N.C. 27573

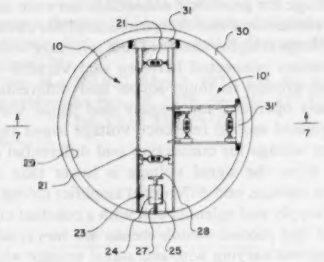
Filed Sep. 15, 1976, Ser. No. 723,495

Int. Cl.[2] B28B *7/30, 7/16;* E02D *29/10*

U.S. Cl. 249—11 **6 Claims**

1. A system of forms for use with concrete and other setable materials comprising: a first relatively thin walled, semi-cylindrical form means having two open end portions and being elongated so as to define a longitudinal axis through said form means, an open side and two edges adjacent such side; means secured adjacent and extending between opposite edges across said open side for drawing said edges toward each other; a generally flat cover means removably enclosing said open side of said form; means for releasably retaining said cover means relative to said form means; and an adjustable anchoring means connected to said form means adjacent one of said open end

portions and movable in a direction generally parallel to said longitudinal axis for steadying said form means during the



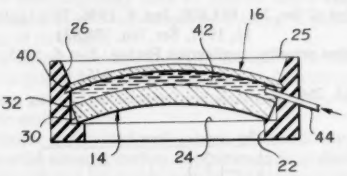
pouring of setable material whereby an improved form system is provided.

4,085,919

LENS-CASTING CELL

Philip J. Sullivan, Worcester, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 713,933, Aug. 12, 1976, abandoned. This application Jul. 5, 1977, Ser. No. 812,925
Int. Cl.² B29C *1/00*; B29D *11/00*
U.S. Cl. 249—134 **3 Claims**



1. A lens-casting cell comprising:

an annular gasket of resilient material having an inwardly directed flange adjacent a first of its sides, an internally disposed perimetrical groove adjacent its second side and an inner uniformly diametrally dimensioned wall extending between said flange and groove, there being in internal chamfer adjacent said second side of said gasket and extending inwardly and toward said groove to facilitate entrance of said first and second mold halves through said second side of said cell, said cell requiring single side loading of said mold halves

a first meniscus mold half of circular configuration seated against said flange internally of said gasket, said mold half being of an outer diametral dimension greater than that of said wall of said gasket for indenturing said gasket wall and providing a fluid tight seal between said first mold half and gasket;

a second meniscus mold half of circular configuration having a diametral dimension greater than said diametral dimension of said gasket wall, said second mold half being peripherally engaged in said groove; and

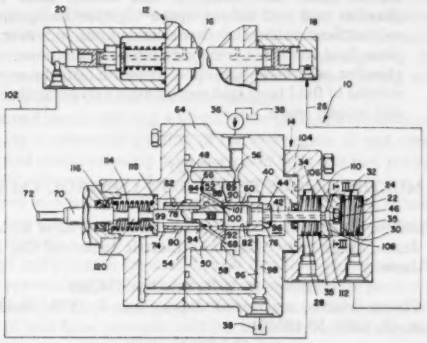
said first and second meniscus mold halves each having concave and convex opposite sides, a convex side of one of said mold halves and a concave side of the other of mold half being disposed in spaced facing relationship to form a lens casting cavity therebetween.

4,085,920

PILOT CONTROL VALVE WITH SERVO MEANS

Claude A. Waudoit, Villers-la-Ville, Belgium, assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 15, 1976, Ser. No. 742,033
Int. Cl.² F16K *31/122*; F15B *13/042*
U.S. Cl. 251—57 **10 Claims**



6. In a valve system comprising a fluid operated main control valve and adjustable servo valve means for controlling said main valve, said main valve including a main valve spool reciprocal therewithin, an improved adjusting means operating via fluid displacement, comprising:

a servo valve housing having a hole therein and a rod movable within said hole, a first end of said rod extending from said housing to allow operator-initiated movement of said rod within said hole;

a sleeve within said hole, a first end of said sleeve opening towards said first end of said rod and a second end of said sleeve opening away from said first end of said rod, said sleeve having an exterior surface fitting reciprocally adjacent a control portion of said hole and an interior surface against which said rod reciprocally fits, said sleeve having a flange extending outwardly from the exterior surface thereof intermediate said first and second ends of said sleeve in reciprocating fit within a control bore coaxial with said hole and extending outwardly into said housing from said control portion of said hole, said flange separating said control bore into a first control chamber and a second control chamber;

a pressurized fluid source communicating via a first restricted orifice with said first control chamber and via a second restricted orifice with said second control chamber;

a first passageway from said first control chamber to a first position on the interior surface of said sleeve;

a second passageway from said second control chamber to a second position on the interior surface of said sleeve, said second position being intermediate said first position and said first end of said sleeve;

a first passage from said first position to a sump;

a second passage from said second position to said sump;

means on said rod for partially increasing the restriction of the respective one of said first and second passages while temporarily partially decreasing the restriction of a respective other thereof so that said flange experiences a pressure differential between said first control chamber and said second control chamber, said pressure differential causing said flange to move within said control bore and said sleeve to move therewith within said hole to reduce said pressure differential by reducing the temporary restriction of said respective one of said first and second passages;

a piston communicating with the second end of said sleeve, said piston being in reciprocating fit within a sensing-

adjusting bore in said housing and separating said sensing-adjusting bore into a first space and a second space;

means flow-communicating said first space with said first main valve chamber, said first main valve chamber and said first space together comprising a first fixed volume; and

means flow-communicating said second space with said second main valve chamber, said second main valve chamber and said second space together comprising a second fixed volume, so that as said piston moves to displace fluid from said first space into said first main valve chamber, said main valve spool moves to displace an equal volume of fluid from said second main valve chamber into said second space.

4,085,921
MULTIPLE-MODE FLUID-FLOW CONTROL VALVE ARRANGEMENT

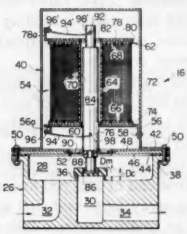
Yasukiyo Ueda; Keiichi Mori, and Keijiro Mori, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Apr. 6, 1976, Ser. No. 674,305

Claims priority, application Japan, Apr. 9, 1975, 50-43658; Aug. 18, 1975, 50-100401

Int. Cl.[2] F16K *31/06*

U.S. Cl. 251—129 **3 Claims**



1. A multiple-mode fluid-flow control valve arrangement comprising, a valve unit operable in different conditions including a variable-flow mode condition passing fluid therethrough at a rate continuously variable between predetermined minimum and maximum values, a constant-flow mode condition passing the fluid therethrough at a fixed rate equal to said minimum value and a zero-flow mode condition interrupting the flow of the fluid therethrough; signal generating means for producing an analog signal representative of a prescribed operational variable; control means responsive to said signal for operating said valve means between said two different conditions depending upon predetermined ranges of said analog signal, said valve unit comprising stationary valve seat means provided between first and second cavities forming part of a passageway for passing the fluid through the valve unit, a valve element movable relative to said stationary valve seat means continuously between a first position seated on said valve seat means and isolating said first and second cavities from each other for establishing said zero-flow mode condition and a second position spaced apart a maximum distance from said valve seat means through a third position spaced apart a predetermined distance from the valve seat means for providing said fixed flow rate, a valve actuator responsive to said signal for moving said valve element between said first and second positions, said valve actuator comprising a solenoid-operated type having a solenoid coil to move said valve element from said first position through a distance which is substantially proportional to the current supplied to said solenoid coil, said signal generating means comprising a variable-voltage element operative to produce as said analog signal a signal voltage representative of the detected magnitude of said operational variable and said control means comprising a constant-current power supply circuit, a differential amplifier circuit connected between said power supply circuit and said solenoid coil, first switch means connected between said differential amplifier and said variable-voltage element and operative to compare said signal voltage with a predetermined first reference voltage for providing connection between said variable-voltage element and said differential amplifier circuit when the signal voltage is higher than said first reference voltage, second switch means connected between said variable-voltage element and ground in shunt across said differential amplifier circuit and operative to compare said signal voltage with a predetermined second reference voltage lower than said first reference voltage for connecting said differential amplifier to ground when the signal voltage is lower than said second reference voltage, said differential amplifier circuit being operative to supply said solenoid coil with a constant current when said first and second switch means are non-conducting and with a current varying with said signal voltage when said first switch means is conducting and said second switch means is non-conducting, said valve element being in said first position when said second switch means is conducting to ground said differential amplifier circuit and deenergized said solenoid coil and in said third position when said solenoid coil is being supplied with said constant current, and said valve element being moved between said second and third positions thereof when said solenoid coil is being energized with said current varying with said signal voltage.

4,085,922
METHOD AND APPARATUS FOR CONTINUOUSLY MEASURING THE ANNEALING LEVEL ON WIRES OR STRIPS

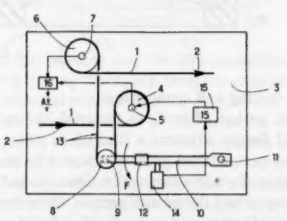
Marc Moreau, Asnieres, France, assignor to Trefimetaux, Paris, France

Division of Ser. No. 691,608, Jun. 1, 1976. This application Jan. 12, 1977, Ser. No. 758,831

Claims priority, application France, Jun. 6, 1975, 75 18328

Int. Cl.[2] C21D *9/64*

U.S. Cl. 266—90 **12 Claims**

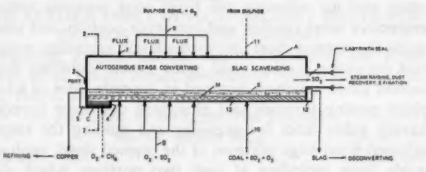


1. An apparatus for continuously measuring and adjusting the annealing level on wire or the like comprising, at the discharge end of a continuous annealing installation, an upstream capstan, a freely rotating pulley of a diameter smaller than said upstream capstan downstream of the upstream capstan, a pivotally mounted arm, said arm including a free end mounting said pulley, means for applying a force to said arm tending to bias said arm and pulley in a first direction, a downstream capstan, means for controlling the speed of one of the capstans in response to the position of the arm, the wire or the like passing successively over the upstream capstan, the arm mounted pulley to the side thereof toward which the pulley is biased, and the downstream capstan, the diameter of the pulley and the tension in the wire as it moves thereabout being such so as to effect a permanent elongation of the wire or the like as it passes about the pulley and means responsive to the difference in relative speed of the capstans, effected by the elongation of the wire or the like therebetween, for use in adjusting the annealing level.

4,085,923
APPARATUS FOR A METALLURGICAL PROCESS USING OXYGEN

Paul E. Queneau, Cornish, N.H., and Reinhardt Schuhmann, Jr., West Lafayette, Ind., assignors to Q-S Oxygen Processes, Inc., Portland, Me.

Division of Ser. No. 357,012, May 3, 1973, Pat. No. 3,941,587.
This application Sep. 29, 1975, Ser. No. 617,375
Int. Cl.[2] C22B *15/14*
U.S. Cl. 266—215 **9 Claims**



1. An elongated, gently sloped, rounded cross-section, tiltable, refractory-lined furnace for continuously recovering metal values from non-ferrous metal sulphide concentrates, said furnace having inlets for concentrates, flux and oxidizing gas and outlets for value metal-rich material, slag and off-gas, said furnace being adapted to contain a molten bath consisting of a value metal-rich phase extending at least a portion of its length and a slag phase extending its entire length, characterized in that

a. said furnace is sealed;

b. said metal-rich material and slag outlets are located at opposite ends of said furnace;

c. said furnace is provided with several upwardly directed gas injectors extending through the refractory lining thereof communicating with its interior below the bath surface and distributed lengthwise along a substantial portion of its length;

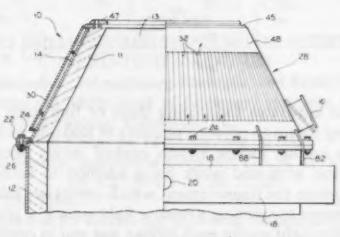
d. at least some of said injectors are provided with independently regulatable means for introduction therethrough of oxidizing gas and protective fluid simultaneously, both in variable amounts; and

e. said furnace is provided with several independently regulatable solid material feeders so positioned as to discharge said concentrates, as a spray with an oxidizing gas directly into the atmosphere within said furnace above the molten bath, said feeders being distributed lengthwise thereof along a substantial portion of its length.

4,085,924
COOLING ASSEMBLY FOR METALLURGICAL VESSELS

Howard M. Fisher, and Harry T. Montgomery, both of New Castle, Pa., assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed Jul. 15, 1977, Ser. No. 815,792
Int. Cl.[2] C21C *5/42*
U.S. Cl. 266—241 **10 Claims**



1. A metallurgical vessel having a top opening and cooling means disposed on the surface of said vessel and adjacent said top opening,

a plurality of elongate members affixed to the surface of said vessel in a side-by-side relation and extending from a mid-region of said vessel toward said top opening, said members defining with the surface of said vessel a plurality of adjacent flow passages having upper ends adjacent said top opening and lower ends adjacent said mid-region,

first means defining a first elongate flow passageway disposed adjacent said top opening and communicating with the upper ends of said flow passages,

second means defining a second flow passageway surrounding a substantial portion of the mid-region of said vessel and communicating with the lower ends of a first portion of adjacent ones of said flow passages,

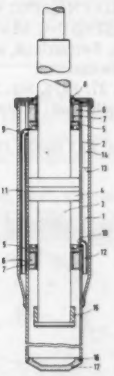
drain means disposed adjacent the lower ends of the remaining ones of said flow passageway and being connected thereto,

and baffle means disposed in said first flow passageway for preventing the flow of cooling water from that portion of said first flow passageway disposed above the first portion of said flow passages until the same are substantially full.

4,085,925
HYDRO-PNEUMATIC SHOCK ABSORBER

Carl Ullrich Peddinghaus, Obere Lichtenplatzer Str. 276, 56 Wuppertal-Barmen, Germany, and Franz Josef Overkott, Gevelsberg, Germany, assignors to Carl Ullrich Peddinghaus, Wuppertal-Barmen, Germany

Filed Mar. 31, 1976, Ser. No. 672,454
Int. Cl.[2] F16F *5/00*
U.S. Cl. 267—64 R **7 Claims**

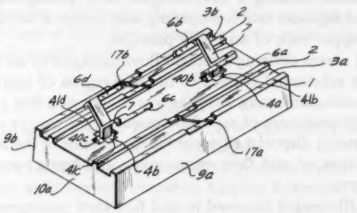


1. A hydro-pneumatic shock absorber of the kind wherein a piston mounted on a piston rod subdivides the interior of a fluid-containing cylinder into two chambers of variable volume, and wherein a compensation chamber is provided for the absorber fluid and a compressed gas pressure is maintained therein, characterized in that the piston is secured to the piston rod approximately in the middle of said rod which in turn projects through a gland at each end of the cylinder and in that each of said two chambers of variable volume communicates with said comensation chamber by means of a communication port which permits flow of hydraulic fluid therethrough in each of two opposite directions of flow.

4,085,926
TAPE SPLICER

Herman D. Post, Great Neck; Edward Perper, Brooklyn, and George Alexandrovich, Sr., Commack, all of N.Y., assignors to Robins Industries Corporation, Commack, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,055
Int. Cl.[2] B23Q 3/00
U.S. Cl. 269—295 13 Claims

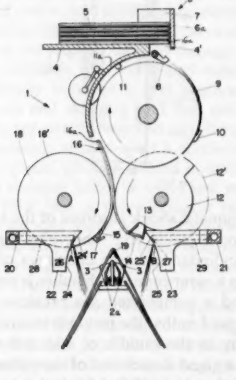


1. A tape splicer, comprising a base; at least one pair of parallel ribs extending longitudinally along said base and delimiting therebetween on said base at least one positioning groove for a tape; a blade-guiding cutting slot intersecting said ribs and a portion of the thickness of said base and a pair of bistable clamping toggles spaced laterally of said groove and longitudinally along said base on opposite sides of the intersection between said slot and said groove and tiltable onto said base, said toggles having a longitudinally extending anchoring axle embedded in said base, arm means extending substantially perpendicularly from said axle and an elongated clamp means provided at the end of said arm means and extending parallel with said base, said toggles being movable between a first stable position in which said clamp means reaches into said groove and engages a tape inserted in said groove to damp motion of said tape during its splicing in the area of said slot, and a second stable position in which the clamp means is withdrawn from said groove.

4,085,927
APPARATUS FOR GATHERING FOLDED SHEETS IN BOOKBINDING MACHINES

Hans Müller, Zofingen, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Oct. 27, 1976, Ser. No. 735,975
Claims priority, application Switzerland, Nov. 14, 1975, 14763/75
Int. Cl.[2] B65H 39/02
U.S. Cl. 270—54 14 Claims



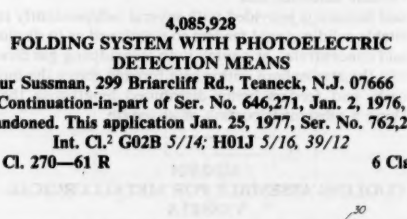
1. Apparatus for gathering folded sheets of the type having a folded back and two front edge portions opposite the back, comprising a conveyor having an elongated portion moving in a predetermined direction; a plurality of magazines adjacent to said conveyor portion and spaced apart from each other, as considered in said direction, each magazine being arranged to store a supply of sheets; and discrete means for delivering sheets from each of said magazines to said conveyor portion, each of said delivering means including means for withdrawing sheets seriatim from the respective magazine in such orientation that the back of each withdrawn sheet is located at a level above the respective front edge portions and above said conveyor portion, spreading means for opening each withdrawn sheet including means for engaging the front edge portions, for moving the thus engaged front edge portions away from each other and for releasing the front edge portions before the respective sheet reaches said conveyor portion, and means to guide the opened sheet intermediate said spreading means and said conveyor portion, said guide means including first and second guide members disposed at opposite sides of a vertical plane passing through said elongated conveyor portion and having guide faces for engaging and guiding the respective released front edge portions of the opened sheet, each of said guide faces including at least two portions which diverge downwardly away from and at different angles to said vertical plane.

7. Apparatus for gathering folded sheets of the type having a folded back, comprising a conveyor having an elongated portion moving in a predetermined direction; a plurality of successive magazines adjacent to said conveyor portion and spaced apart from each other, as considered in said direction, each magazine being arranged to store a supply of sheets; discrete means for delivering sheets from successive magazines onto successive parts of said conveyor portion, including means for opening the sheets and for advancing the opened sheets to said parts of said conveyor portion in such orientation that opened sheets delivered from a preceding magazine are overlapped by opened sheets delivered from the next-following magazine whereby the overlapping and overlapped sheets on successive parts of said conveyor portion form a series of piles in each of which the back of the innermost sheet rides on said conveyor portion; and mechanical means for biasing the sheets against said conveyor portion intermediate said magazines.

4,085,928
FOLDING SYSTEM WITH PHOTOELECTRIC DETECTION MEANS

Arthur Sussman, 299 Briarcliff Rd., Teaneck, N.J. 07666

Continuation-in-part of Ser. No. 646,271, Jan. 2, 1976, abandoned. This application Jan. 25, 1977, Ser. No. 762,274
Int. Cl.[2] G02B 5/14; H01J 5/16, 39/12
U.S. Cl. 270—61 R 6 Claims



1. In an apparatus for folding sheet or film form material comprising means to propel a plurality of foldable work pieces toward a folding means; switch control means operative in combination with said work piece adapted to activate said folding means; the improvement which comprises said switch control means comprising a remote light source; a plurality of optical fiber light guides each having one end in optical alignment for reception of light from said light source and the other end optically aligned, through an optical cable coupling means,

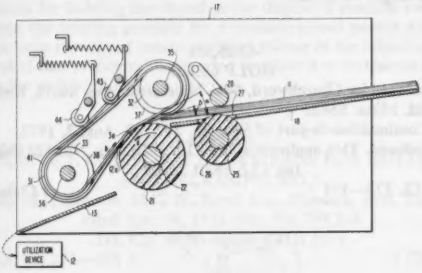
with an optical lens in a projector assembly; mounting means which positions said projector assembly in cleaning relation proximate to said workpieces; photo receptor means comprising photo detector means, spaced from and optically aligned with said projector assembly adapted to permit passage of said work pieces between said receptor means and said projector assembly in a light modulating manner; and means, associated with and operated by each of said photo receptor means, to activate and inactivate respectively said folding means as a function of said workpiece induced light modulation.

4,085,929

PAPER FEEDER INCLUDING AUXILIARY BELTS FOR IMPROVING PAPER FEEDING

Keiji Tuchiya; Junjiro Kubota; Katuo Takahashi, and Etsuo Suzuki, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 4, 1977, Ser. No. 756,652
Int. Cl.[2] B65H *3/52*
U.S. Cl. 271—122 **12 Claims**



1. A paper feeder for successively feeding sheets of paper one by one from a stack thereof to a utilization device through an output point, comprising a feed roller rotatable around a substantially horizontal fixed axis, a first belt movable in contact with a first area of an upper half circumferential surface of said roller, supply means for supplying at least one sheet from said stack to said first area through a planar area approximately tangential to said roller along a line parallel on said first area to said fixed axis, first means for rotating said roller so as to drive said first area in a first sense of drive away from said planar surface towards said output point, and second means for driving said first belt in a second sense of drive opposite at said first area to said first sense, said roller being placed between said planar area and said output point, said first belt being extended partially adjacently of said first area along a first straight line forming a first acute angle with said planar surface, wherein the improvement comprises a second belt in contact with a second area of said upper half circumferential surface, said second belt being extended partially adjacently of said second area substantially parallel to said first belt and along a second straight line forming a second acute angle with said planar area, said second acute angle being smaller than said first acute angle.

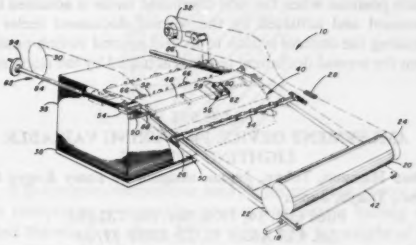
4,085,930

SHEET DELIVERY MECHANISM FOR SHEET FED PRINTING MACHINES

Willi Weisgerber, Johannisberg-Rheingau, and Ernst Federhen, Ingelheim am Rhein, both of Germany, assignors to Miller Western Corporation, Pittsburgh, Pa.

Filed Sep. 28, 1976, Ser. No. 727,337
Claims priority, application Germany, Oct. 4, 1975, 2544566
Int. Cl.[2] B65H *29/04, 31/20*
U.S. Cl. 271—204 **10 Claims**

1. Apparatus for delivering individual sequentially supplied sheets of paper or the like from a delivery source to an area for accumulating a pile of such sheets comprising, a stationary support member, conveying means carried by said stationary support member for transporting individual sheets of such supplied sheets through an elongated delivery path from an entrance end to a discharge portion with each such transported sheet being released within said discharge portion in overlying relationship to an area for receiving a pile of such transported sheets, sheet movement retarding means movably carried by said stationary support member and having at least one portion thereof engageable with the trailing edge of each such transported sheet in said discharge portion, said retarding means being selectively movable to vary the length of said delivery path and the location at which said trailing edge of each such transported sheet is engaged in said discharge portion with respect to said entrance end, sheet support means carried by



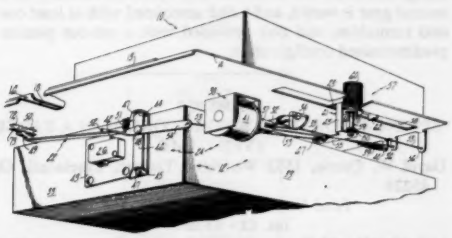
said stationary support member having an elongated surface thereon extending below at least a portion of said delivery path from said entrance end to adjacent said retarding means, said surface being of an extent and spacing with respect to said portion of said delivery path to maintain a cushion of air between said surface and each such transported sheet while moving through said portion of said delivery path, and said sheet support means having at least a portion thereof selectively movable to vary the length of said surface below said portion of said discharge path in conformity with the variations of length of said portion of said delivery path resulting from selectively locating said retarding means and maintain said cushion of air regardless of the location of said retarding means.

4,085,931

DOCUMENT ACTUATED INTERLOCK MECHANISM

Ludwick Szeluga, South Windsor, and Howard J. Voegelin, Cheshire, both of Conn., assignors to Veeder Industries Inc., New York, N.Y.

Filed Mar. 28, 1977, Ser. No. 781,589
Int. Cl.[2] B65H *5/00*
U.S. Cl. 271—265 **6 Claims**



1. In a document processing machine adapted to be successively conditioned, first in preparation for processing a document and subsequently for processing a document and having a document channel for feeding a document along a predetermined path to an initial processing station of the machine and

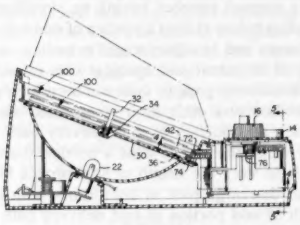
a document actuated interlock mechanism for selectively conditioning the machine in its said first preparatory condition when a document is partly fed along said predetermined path to said initial processing station and in its said subsequent processing condition when the document is fully fed to said initial processing station and having a control switch adapted to be successively actuated to first and second switching positions thereof for successively conditioning the machine in its said preparatory and said subsequent processing conditions respectively; the improvement wherein the document actuated interlock mechanism comprises first and second document feelers along said predetermined path adapted to be actuated by the document when it is partly and fully fed to said initial processing station respectively, and mechanical interconnect means having switch operating means actuated by the first document feeler for operating the control switch to its said first switch position when the first document feeler is actuated by a document and actuated by the second document feeler for operating the control switch to its said second switch position when the second document feeler is actuated by the document.

4,085,932

AMUSEMENT DEVICE FEATURING VARIABLE LIGHTING EFFECTS

Nubuo Hamano, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,193
Int. Cl.[2] A63H *33/22*; G09F *11/04*
U.S. Cl. 272—8 P **10 Claims**



1. An amusement device, comprising a housing, a light source within said housing, first and second transparent turntables mounted for rotation with respect to said housing, means rotating said first and second turntables and means permitting the direction and speed of rotation of said second turntable to be varied with respect to said first turntable, including a first gear wheel mounted for rotation and having radially extending ridges on one face thereof, a shaft mounted for rotation, a second gear mounted to slide along said shaft and including teeth along the periphery thereof which mesh with said ridges of said first gear wheel such that as said second gear slides along said shaft the direction and speed of rotation of said second gear is varied, and a disk associated with at least one of said turntables, said disk provided with a cut-out pattern of predetermined configuration.

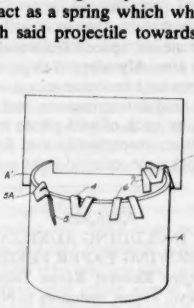
4,085,933

SPRING-HOOK DEVICE FOR SCORING IN A TARGET TYPE GAME

David W. Currie, 1552 Wittekind Terrace, Cincinnati, Ohio 45224

Filed Dec. 27, 1976, Ser. No. 754,333
Int. Cl.[2] A63B *71/00*
U.S. Cl. 273—95 R **6 Claims**

1. In a game of the type having a game target receptacle with a raised edge, an integral one piece projectile playing element bent so as to have a first planar portion and a second planar portion forming an acute angle with one end of said first planar portion, said first planar portion being V-shaped and said second planar portion being extensions of the legs of said first portion, said projectile being composed of a resilient material so allowing it to act as a spring which when pressed and released may launch said projectile towards said game target



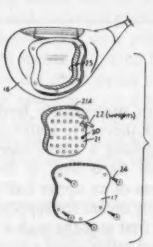
receptacle, whereby a score may be obtained when said projectile is received completely within said receptacle or when said first and second portions hook over the raised edge of said game target receptacle.

4,085,934

GOLF CLUB

Roy Alexander Churchward, 6444 Nineteenth Ave. South, Richfield, Minn. 55423

Continuation-in-part of Ser. No. 277,739, Aug. 3, 1972, abandoned. This application Dec. 10, 1973, Ser. No. 423,080
Int. Cl.[2] A63B *53/08*
U.S. Cl. 273—171 **3 Claims**



1. A golf club comprising a shaft, a grip disposed at one end of said shaft and a club head disposed at the other end of said shaft, said club head including a body portion, an impact block means disposed in said body portion and a sole plate, said sole plate substantially covering the bottom of said club head, said impact block means having defined therein a plurality of openings and a plurality of weights disposed in selected ones of said openings, said weights being cylindrical in shape and being slideably inserted in said openings, the axis of said cylindrical weights being perpendicular to said sole plate, said weights extending only through a portion of said impact block means and said impact block means being invertable to raise and lower the weights in said club head.

4,085,935

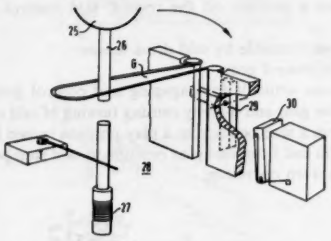
AMUSEMENT DEVICE

John James Mason, Carlton, England, assignor to J. J. Mason Limited, Great Britain

Filed Sep. 7, 1976, Ser. No. 720,806
Claims priority, application United Kingdom, Sep. 6, 1975, 36773/75
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—185 D **7 Claims**

1. A device for practicing repetitive striking movements comprising a support, a strikable object mounted on said support for movement towards a displaced position and biassed into the striking position, adjustable detecting means mounted

on said support to detect movement of the object when struck, said detecting means being adjustable to select a width of a predetermined path of travel of said object, means to signal when that movement follows said predetermined path, said signalling means being actuated by said detecting means,



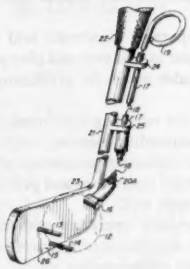
means for holding the object in the displaced position remote from the striking position for a predetermined period after it has been struck and means to effect release of the object at the end of that predetermined period to allow it to be biassed back to the striking position.

4,085,936

PRACTICE GOLF CLUB WITH MEANS FOR HOLDING AND RELEASING BALL

Roy M. Patterson, 1547 W. Beryl Ave., Phoenix, Ariz. 85021

Filed Apr. 18, 1977, Ser. No. 788,518
Int. Cl.[2] A63B *69/36;* F41B *3/04*
U.S. Cl. 273—186 A **9 Claims**



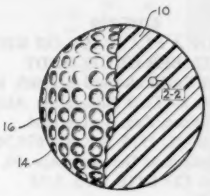
1. A practice golf club comprising:
a shank portion having a hand gripping area at one end,
a head portion having a ball striking surface mounted at the other end of said shank portion,
at least one projecting member extending outwardly from said striking surface a distance less than the diameter of a golf ball,
means for detachably positioning and holding a golf ball against said member,
said means comprising an elongated member mounted on and arranged to extend juxtapositioned to said shank from a point adjacent said gripping area to a point adjacent said striking surface,
a finger grip formed on one end of said elongated member adjacent said gripping area for grasping by a finger of the hand of the user engaging the gripping area,
a holding finger means mounted on the other end of said elongated member adjacent said striking surface and biased for holding a golf ball against said projecting member and biasing said elongated member toward said projecting member,
whereby when said elongated member is pulled toward said gripping area by a finger of a user against the biasing action of said holding finger means a golf ball held between said holding finger means and said projecting member will be released.

4,085,937

COMPOSITION FOR A FLOATER GOLF BALL AND THE FLOATER GOLF BALL MADE THEREFROM

Bernard H. Schenk, Crown Point, Ind., assignor to Hugh J. McLaughlin & Son, Inc., Crown Point, Ind.

Filed Sep. 26, 1975, Ser. No. 617,267
Int. Cl.[2] A63B *37/00;* C08J *9/32;* C08K *7/14*
U.S. Cl. 273—218 **8 Claims**



1. A polymeric composition suitable for molding floater golf balls comprising a peroxide-coagent vulcanizate having dispersed therein from about 5% to about 10% by weight of the composition of hollow glass microspheres wherein at least 90% by volume of said microspheres have a size of from about 20 to about 95 microns, have a density in the range of from about 0.2 to about 0.4 grams/cc., and have a ratio of wall thickness to diameter in the range of from about 1.5% to about 3.0%, wherein said polymeric composition has a specific gravity of less than 0.98.

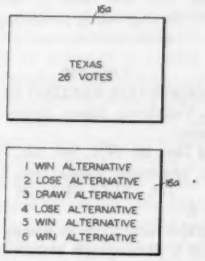
4. A floater golf ball having a weight of less than about 39 grams and comprising a preformed solid core, said core being compounded of a peroxide-coagent vulcanizate intermixed with a flotation material comprising from about 5% to about 10% by weight of hollow glass microspheres dispersed throughout said core, wherein at least 90% by volume of said microspheres have a size of from about 20 to about 95 microns, said microspheres have a density in the range of from about 0.2 to about 0.4 grams/cc., and said microspheres have a ratio of wall thickness to diameter in the range of from about 1.5% to about 3.0%.

4,085,938

ELECTION GAME APPARATUS AND METHOD OF PLAYING SAME

James H. Bean, Jr., 336 Jerris St., SE., Salem, Oreg. 97302

Filed Mar. 16, 1977, Ser. No. 778,075
Int. Cl.[2] A63F *3/04*
U.S. Cl. 273—279 **9 Claims**



1. A game apparatus comprising:
(a) a board displaying a map of the United States showing each state thereof;
(b) a deck of playing cards equal in number to the number of

states shown on the board, each card having indicated thereon one of the states represented on the board, there being one card for each state shown on the board;

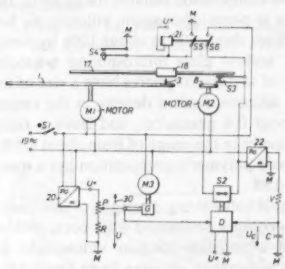
(c) each card having indicated thereon an equal number of play alternatives including a predetermined number of win alternatives and a predetermined number of lose alternatives, and having indicated thereon a set of different identifying indicia, a respective one of said indentifying indicia being randomly associated with each of the play alternatives; and

(d) means for randomly generating one of the set of identifying indicia.

4,085,939
REWORKING OF A PLAYBACK OR RECORDING MEMBER GUIDE BODY

Günter Joschko, and Karl-Ekkehard Schriefl, both of Berlin, Germany, assignors to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec, Zug, Switzerland

Filed Apr. 21, 1976, Ser. No. 678,764
Claims priority, application Germany, Apr. 30, 1975, 2519172
Int. Cl.[2] G11B *3/56, 3/58*
U.S. Cl. 274—1 R **12 Claims**



1. In a method for repeatedly reworking a body whose tip, during use, engages a record carrier track to guide a playback or recording member along the track, by subjecting the body to successive reworking operations, each such operation occurring between successive periods of use, each period of use being accompanied by wearing of the tip to a certain maximum depth and alteration of the original tip shape and each reworking operation involving removal of material from the tip of the body to a certain maximum depth to restore the original shape of the tip, the improvement comprising, over the lifetime of the body: deriving a detectable representation of at least an approximation of the maximum wear depth occurring during each period of use between successive reworking operations; and automatically adjusting the maximum removal depth during successive reworking operations to maintain a predetermined relationship with the value of such maximum wear depth during each corresponding preceding period of use.

4,085,940
PHONOGRAPH RECORD PLAYER

Susumu Hoshimi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan

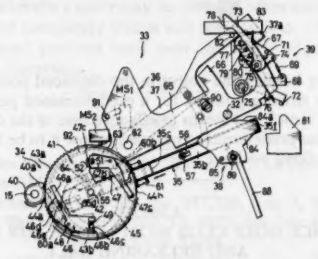
Filed Dec. 16, 1976, Ser. No. 751,180
Claims priority, application Japan, Dec. 17, 1975, 50-150896
Int. Cl.[2] G11B *17/06*
U.S. Cl. 274—15 R **24 Claims**

1. In a phonograph record player having a rotatable turntable for supporting a phonograph record during the playing thereof, drive means including an electric motor operable for rotating said turntable, and a tone arm assembly including a tone arm carrying a pickup with a stylus to track the groove of a phonograph record on said turntable during playing of the record and being mounted for lateral swinging across said turntable and for raising and lowering of the tone arm relative to said turntable: control means capable of a lead-in operation for effecting lead-in movement of said tone arm from an elevated rest position outside the perimeter of said turntable to a set-down position on a record supported by said turntable so as to commence said playing of the record, and a return operation for effecting a return movement of said tone arm to said rest position from a position on the record, said control means comprising

a drive gear rotatable by said drive means;

a rotatable control gear;

clutch means actuable for engaging said control gear with said drive gear and thereby causing turning of said control gear from a stop position to a play position in said lead-in operation and from said play position to said stop position in said return operation;



lever means engaged with said control gear and being swingable by the latter for effecting said lead-in and return movements of the tone arm in response to said turning of the control gear in said lead-in and return operations, respectively;

trigger means operable to actuate said clutch means with said control gear in said stop and play positions thereof; p1 manually actuable means for generating an electrical command signal;

memory means for retaining said command signal and providing a corresponding memory output;

sensor means for detecting completion of at least one of said lead-in and return operations and providing a corresponding sensor output; and

means for electrically operating said trigger means in response to the simultaneous occurrence of said memory output and said sensor output.

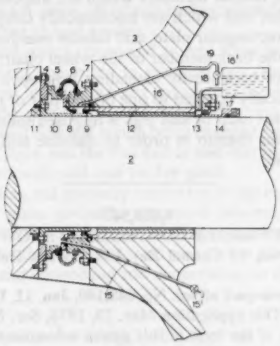
4,085,941
STERN SEALS FOR SHIPS

Samuel Clifford Walter Wilkinson; Ronald Sydney Sweett, both of Chichester, and Thomas Walter Bunyan, London, all of England, assignors to Crane Packing Limited, Slough, England

Filed Jun. 11, 1976, Ser. No. 694,956
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—3 **7 Claims**

1. A stern seal and bearing assembly for ships comprising a bearing, a stern shaft rotatable in said bearing, means for supplying low pressure oil to said bearing, said bearing having inboard and outboard ends, a first seal assembly mounted at the outboard end of said bearing, a second seal assembly axially spaced away from said first seal assembly in a direction away from said bearing, a stern frame, said stern frame having mounted therein said first and second seal assemblies and said bearing and defining, between said seal assemblies, a void

space, and means draining said void space, said first seal assembly comprising two lip seals spaced apart axially to define a



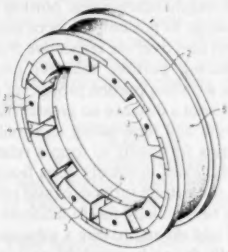
second void space and directed towards one another, and means draining said second void space.

4,085,942

PACKING FOR USE IN STEEL-PIPE HYDRAULIC TESTING APPARATUS

Mitsuo Yoshida, Osaka; Wataru Furukawa; Takashi Yamaguchi, both of Wakayama, and Kazuo Sasaki, Minoo, all of Japan, assignors to Sumitomo Kinzoku Kogyo Kabushiki Kaisha, Osaka; Kabushiki Kaisha Yamamoto Suiatsu Kogyosho, Toyonaka and Nihon Valqua Kogyo Kabushiki Kaisha, Tokyo, all of, Japan

Filed Sep. 16, 1976, Ser. No. 724,057
Claims priority, application Japan, Oct. 6, 1975, 50-120500
Int. Cl.[2] F16J *15/16*
U.S. Cl. 277—30 **1 Claim**



1. A seal for use in the hydraulic testing of a pipe length, said seal comprising an annular resilient body, an annular recess in and around the inner periphery of said body, arcuate backing pieces of hard material mounted in said inner annular recess at locations circumferentially spaced relative to each other, and a plurality of adaptor pieces of hard material embedded in said annular recess and circumferentially spaced relative to each other in such manner as to bridge the spaces between adjacent backing pieces and be slidable on the outer peripheral surfaces thereof.

4,085,943

SELF EJECTING DRILL CHUCK KEY

Sigmund D. Travis, Brookfield, Ill., assignor to C. R. Reichel Engineering Co. Inc., San Francisco, Calif.

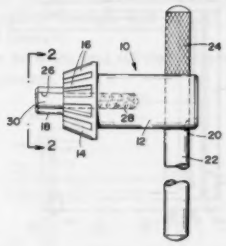
Filed Oct. 12, 1976, Ser. No. 731,782
Int. Cl.[2] B25B *13/44*
U.S. Cl. 279—1 K **5 Claims**

1. A self ejecting drill chuck key device comprising:

a key element with a plurality of teeth adapted to mesh with matching teeth of a drill chuck assembly;

a main body extending axially from one end of said key element and having a handle member;

a guide pin extending from the other end of said key element and being axially aligned with said element and said body, said guide pin having a groove on one side along its full length, said groove being axially aligned with a bore that extends through said element and terminates within said



body, said bore having a larger cross section than said groove;

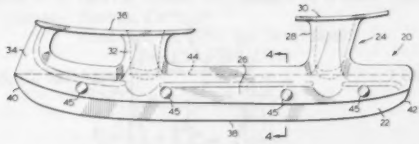
and a slidable ejector member within said groove having an outer end that remains essentially flush with the outer end of said pin when said device is not in use and spring means attached to the inner end of said ejector member and extending within said bore for allowing retraction of said ejector member upon movement of said key element into its operative position.

4,085,944

COMPOSITE SKATE ASSEMBLY

Alan F. Chambers, Agincourt, Canada, assignor to Nylite Skate Company of Canada Ltd., Markham, Canada

Continuation-in-part of Ser. No. 678,007, Apr. 16, 1976, abandoned, which is a continuation-in-part of Ser. No. 608,499, Aug. 28, 1975, abandoned. This application Dec. 20, 1976, Ser. No. 752,343
Int. Cl.[2] A63C *1/32*
U.S. Cl. 280—11.12 **7 Claims**



1. An ice skate assembly of the type including a hardened steel blade and a blade-supporting body of synthetic plastic material adapted to be mounted to a skate boot, the blade including an ice-engaging lower surface and a transversely rounded upper surface, and defining a plurality of longitudinally spaced holes formed transversely of said blade subadjacent the upper surface of the blade, the blade-supporting body including a downwardly opening groove generally coextensive in length with the upper surface of the blade, the blade being partially disposed within the body and the bottom of the groove being rounded to match the upper surface of the blade so that the upper surface of the blade seats against the bottom of said groove, said body defining a plurality of holes formed transversely of said groove and coaxially aligned with the holes in the blade, and the assembly further including fastening means extending through the aligned body and blade holes to mechanically interlock the blade to the body.

4,085,945

VEHICLE SUSPENSION SYSTEM

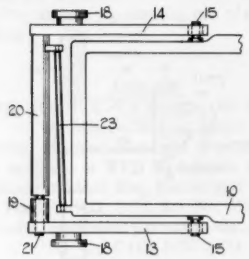
John Richard Bicht, Hemel Hempstead, and Peter Stuart Warner, Henlow, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Sep. 20, 1976, Ser. No. 724,672

Claims priority, application United Kingdom, Oct. 3, 1975, 40484/75

Int. Cl.² B60G *11/16*

U.S. Cl. 280—106.5 R **2 Claims**



1. A suspension system for a pair of vehicle rear wheels comprising a pair of elongate arms each having first and second opposite ends, means at a first end of each arm for pivotal connection of said arms to the frame of the vehicle so that the arms extend rearwardly of said pivotal connections, two wheel hubs carried by said arms respectively at positions to the rear of said first ends, and a member connecting said second ends of said arms together across the vehicle, said member incorporating a single pivotal joint which is capable of rotation about an axis lengthwise of said member, and the system further comprising springs arranged to act between said member and the vehicle frame.

4,085,946

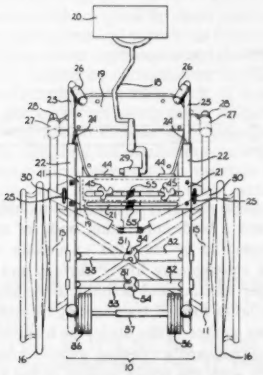
WHEEL CHAIR CONVERTER

Leon B. Krupp, 4800 N. Stanton, El Paso, Tex. 79902

Filed Jan. 27, 1977, Ser. No. 762,872

Int. Cl.² A61G *15/00*

U.S. Cl. 280—289 WC **3 Claims**



1. For use in combination with a wheel chair having a frame which includes a seat member, a back member, and side members, a set of large rear wheels and a set of small front wheels, a wheel chair converter, for converting the wheel chair to a dental chair, comprising:

a. a back rest and head rest assembly;

b. a rectangular plate member which is mechanically coupled to said back rest and head rest assembly, said rectangular plate adapted to span the back member of the frame of the wheel chair laterally;

c. a pair of tubular members which are disposed parallel to each other and which are mechanically coupled together by said rectangular plate, said tubular members are placed behind the back member of the wheel chair; and

d. a pair of backwardly extending legs, each of which is mechanically coupled to one of said pair of tubular member so that each of said legs is disposed substantially perpendicular thereto in order to stabilize said wheel chair converter.

4,085,947

REARWARDLY CONTROLLED SNOW SKIS

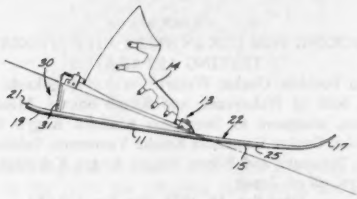
John J. Sarver, 11 Carmel Bay Dr., Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 648,140, Jan. 12, 1976, Pat. No. 4,007,946. This application Mar. 23, 1976, Ser. No. 669,643

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.² A63C *5/04*

U.S. Cl. 280—607 **11 Claims**



1. A pair of rearwardly controlled snow skis for mounting ski bindings thereon for receipt of ski boots, each ski comprising:

a relatively rigid weight-bearing rear portion for mounting of said ski bindings to position the boot received therein with the toe and heel over the respective front and rear of said weight-bearing portion, said ski projecting rearwardly to form a trailing portion projecting rearwardly of the heel of said boot a distance no greater than 17% of the overall ski length and terminating in a trailing edge and further projecting forwardly to form a relatively flexible planing portion turned upwardly at its front extremity to form a shovel, the bottom surfaces of said rear and planing portions being substantially flat to facilitate shifting from side-to-side of said ski and having a substantially continuous downwardly facing longitudinal contour; and

the top and bottom surfaces of said planing portion tapering gradually and continuously forwardly and inwardly toward one another to form a relatively thick aft-end joined with said weight-bearing portion and narrowing to a relatively thin forward end joined with said shovel, the lateral sides of said ski further tapering inwardly and rearwardly from the width of said shovel to terminate at said trailing portion in a relatively narrow aft-end, the total length of said ski being at least 90 centimeters.

4,085,948

VEHICLE SUSPENSION

William Stanley Turner, Northallerton, England, assignor to York Trailer Company Limited, Northallerton, England

Filed Feb. 23, 1976, Ser. No. 660,325

Claims priority, application United Kingdom, Nov. 17, 1975, 47308/75

Int. Cl.² B60G *5/04*

U.S. Cl. 280—682 **9 Claims**

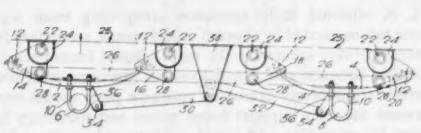
1. A tandem axle suspension system for a vehicle, said suspension system connecting a front axle and a rear axle together

in tandem, said suspension system, on each side of said vehicle, comprising

a front rocker plate, at least one central rocker plate, and a rear rocker plate, all of said rocker plates being pivotally connected to said vehicle,

a front leaf spring connected to said front axle, and a rear leaf spring connected to said rear axle, the front end of said front leaf spring being engaged with said front rocker plate, the rear end of said front leaf spring and the front end of said rear leaf spring being engaged with said central rocker plate, and the rear end of said rear leaf spring being engaged with said rear rocker plate,

a connecting rod pivotally connected at one end to said front rocker plate, pivotally connected intermediate the ends thereof to said central rocker plate, and pivotally connected at the rear end to said rear rocker plate, said rocker plates and connecting rod cooperating so that, when one



of said axles is subjected to a vertical load during use, a part of that load is transmitted through said connecting link and said rocker plates to the other of said axles to establish sharing of the load between said axles,

at least one slipper pad connected to each rocker plate, each slipper pad being positioned to rest on the upper face of an end of a leaf spring, those slipper pads cooperating with said front leaf spring being located forwardly of the pivot connections of said front and central rocker plates, and those slipper pads cooperating with said rear leaf spring being located rearwardly of the pivot connections of said central and rear rocker plates, and

a first radius rod connected at one end to said front axle and at the other end to said vehicle, and a second radius rod connected at one end to said rear axle and at the other end to said vehicle, said radius rods preventing front-to-rear motion of said axles but permitting up-and-down motion of said axles.

4,085,949

RECORDING SHEETS

Yasuzi Asao, and Yasuhiro Ogata, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sep. 22, 1976, Ser. No. 725,905

Claims priority, application Japan, Sep. 22, 1975, 50-114432

Int. Cl.[2] B32B *3/26;* **B41M** *5/16, 5/22*

U.S. Cl. 282—27.5 **6 Claims**

1. A recording sheet comprising a support having coated thereon a continuous layer of microcapsules containing color former, said microcapsules being 0.1 to 100 microns in size and said support having a regularly embossed pattern thereon, said pattern being about 10 to 250 mesh and having a depth of 1 to about 200 microns.

4,085,950

GAS RISER APPARATUS AND METHOD

Sam Alewitz, Painesville, Ohio, assignor to Perfection Corporation, Madison, Ohio

Continuation of Ser. No. 495,200, Aug. 6, 1974, and a continuation-in-part of Ser. No. 349,681, Apr. 10, 1973. This application Oct. 22, 1976, Ser. No. 735,106

The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.

Int. Cl.[2] F16L *21/00*

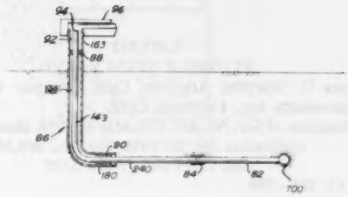
U.S. Cl. 285—45 **2 Claims**

1. A double-walled riser apparatus for conducting fluid from a non-metallic service line disposed below ground level to a point of delivery at a member above ground level, said apparatus comprising in combination:

a tubular element having a first end and a second end, said first end being adapted to be disposed above ground level there being provided means at said first end to connect said tubular element to a delivery member, said tubular element having a sufficient length such that said second end thereof is disposed below ground level;

fluid conducting means having a first end and a second end, said first end of said fluid conducting means being disposed within said tubular element, said fluid conducting means extending through said tubular element to said second end thereof;

sealing means between said tubular element and said fluid conducting means;



said sealing means coacting with said tubular element and said fluid conducting means;

said tubular element being defined by a metallic member;

said fluid conducting means being defined, at the second end thereof, by a non-metallic tubular member, there being provided means at said second end of said fluid conducting means to interconnect said fluid conducting means to a nonmetallic service line disposed below ground level;

whereby, fluid from a buried non-metallic service line may be conducted to a delivery member above ground level by means of said fluid conducting means, the portion of said fluid conducting means located above ground level being protected by said tubular element, said sealing means prohibiting the flow of gas between said tubular element and said gas conducting means at a location below said sealing means.

4,085,951

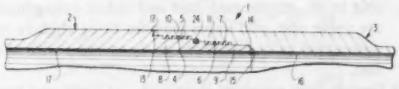
HYDRIL-TYPE CONNECTOR

James B. N. Morris, Gretna, La., assignor to Wonder Products Company, Harvey, La.

Filed Oct. 28, 1976, Ser. No. 736,492

Int. Cl.[2] F16L *15/00*

U.S. Cl. 285—334 **7 Claims**



1. A joint for interconnecting a pair of pipes, said joint comprising coaxial pin and box members respectively including interengaged external and internal first threads, and interengaged external and internal second threads, said first threads on said pin member being adjacent the free terminal forward end of said pin member and being of smaller outer diameter than said second threads, said threads holding the pipes against separation, said first threads and said second threads having substantially the same pitch and outline characteristics, said pin member being screwed about its axis longitudinally forwardly into said box member, metal-to-metal seating surfaces on said pin and box members, said surfaces in interengagement when undamaged, an annular pin member shoulder providing a stepped portion on said pin member between said first threads

and said second threads, an annular box member shoulder providing a stepped portion on said box member between said first threads and said second threads, said pin member shoulder being contiguous with an annular groove opening radially outwardly and extending about said pin member, and an annularly continuous ring of relatively rigid, internally tenacious plastic or rubber material received in said groove, the axial relationship between undamaged metal-to-metal seating surfaces, the first and second threads, the ring and the pin member shoulder and the box member shoulder being such that when the said joint is made up to cause said metal-to-metal seating surfaces to interengage, the ring is compressed between said pin member shoulder and said box member shoulder to form a seal.

4,085,952

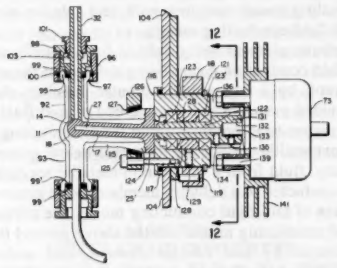
FLEXIBLE STEM VALVE

Thomas D. Sharples, Atherton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 467,278, May 6, 1974, abandoned. This application Jul. 28, 1975, Ser. No. 599,360

Int. Cl.[2] F16K *11/00, 5/00*

U.S. Cl. 251—298 **10 Claims**



1. A valve comprising in combination:

a valve body having a chamber with surrounding walls formed with fluid-conveying openings through the walls into the chamber,

an elongated resilient connector mounted in at least one of said openings, one end of said connector extending into said chamber to form a movable valve seat, said one end of said connector being unsupported in a lateral direction with respect to the longitudinal axis of said connector,

a valve member for cooperation with the valve seat, movable in an arcuate path into and out of engagement with the valve seat, said valve member being slightly recessed within said valve seat when in engagement with said valve seat,

a flexible stem mounted in one of said walls and having an inner end extending into said chamber, the stem being of sufficient flexibility to permit deflection of the inner end, and

means for deflecting the inner end of the stem, the inner end being in operative relationship with the valve member, whereby deflection of the inner end of the stem moves the valve member into or out of engagement with the valve seat, said one end of said connector with said valve seat movable within said chamber to allow said valve seat to shift as a unit laterally to engage and follow said valve member in a sealed relation to ensure a satisfactory seal between said valve member and said valve seat as said valve member moves in said arcuate path to engage said valve seat.

4,085,953

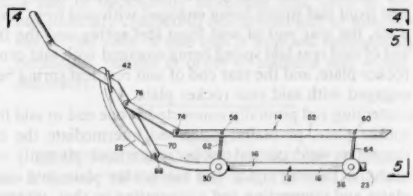
DOLLY APPARATUS

Paul E. Farwell, 5503 E. Archer, Tulsa, Okla. 74115

Filed Jun. 16, 1976, Ser. No. 696,577

Int. Cl.[2] B66F *5/00*

U.S. Cl. 254—10 C **1 Claim**



1. A wheeled dolly apparatus comprising main support frame means carried by support wheel means, secondary frame means movably secured to the main support frame means and movable between raised and lowered positions with respect thereto, transversely extending rotatable plate means secured between the main support frame means and seconeary frame means for providing said raised and lowered positions for the secondary frame means, lifting lever means operably connected between the main support frame means and the secondary frame means for moving the secondary frame means between said raised and lowered positions, latch means engagable with said lifting lever means for locking the secondary frame means in said raised position, said main support frame means being of a width less than the inboard dimension of said support wheel means, and said secondary frame means being of a width greater than the outboard dimension of the support wheel means, and wherein said main support frame means comprises a pair of spaced longitudinally extending mutually parallel side brace members, a plurality of cross members secured between said side brace members, a pair of pipe members extending between said side brace members and having the opposite ends thereof open, an axle member disposed in each of said pipe members and having the opposite ends thereof extending longitudinally beyond the respective pipe members, wheel members journalled at the opposite ends of each of said axle members and disposed outboard of the said side brace members to provide said support wheel means for the dolly apparatus, and wherein said rotatable plate means comprises transversely extending pipe members provided on the secondary frame means in the proximity of each of the first mentioned pipe members, and transversely extending plate means secured between the complementary positioned pipe members of the main frame means and secondary frame means, and wherein the secondary frame means includes a pair of transversely spaced mutually parallel longitudinally extending side frame members terminating along the side edges thereof slightly outboard of the support wheels and overlaying a portion of the support wheels in the lowered position of the secondary frame means.

4,085,954

SLAT ASSEMBLY FOR CHAIN LINK FENCE

Omer A. Thompson, 25080 S.E. Hwy. 212, Boring, Oreg. 97009

Continuation of Ser. No. 475,669, Jun. 3, 1974, abandoned. This application Jun. 5, 1975, Ser. No. 583,918

Int. Cl.[2] B21F *27/00*

U.S. Cl. 256—34 **2 Claims**

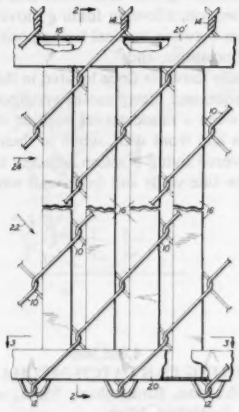
1. For use with chain link fencing, a slat assembly comprising:

a. a plurality of elongated slats proportioned to be woven flatwise through the links of chain link fencing in spaced, parallel arrangement, and

b. an elongated retainer member U-shaped in cross section having an external thickness not exceeding the corresponding thickness of the fence link openings, whereby to

accommodate insertion of the retainer member flatwise through the fence link openings adjacent one end of the slats and at an intercepting angle to the latter,

c. the U-shaped retainer member having spaced parallel sides closed at the end away from the slat ends and open



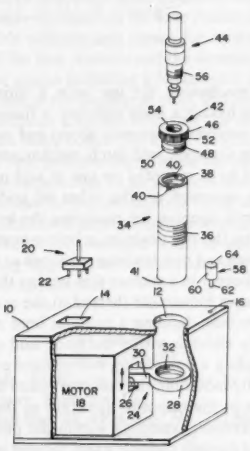
at the end facing the slats for receiving the slat ends for retention within the retainer member, the internal width of the retainer member between the spaced parallel sides thereof being substantially the same as the external flatwise width of the slats.

4,085,955

PEN SHAKING DEVICE

Donald A. Salle, 3313 Shasta Dr., San Mateo, Calif. 94403

Filed Nov. 22, 1976, Ser. No. 744,005
Int. Cl.² B01F *11/00*; B08B *7/02*
U.S. Cl. 366—212 **16 Claims**



1. Apparatus for vibrating a member, comprising:

a) a housing;

b) a casing having means for removably holding said member;

c) a shaft, positioned within said housing, having at one end a collar holding said casing, said casing having means for removably connecting said casing within said collar from outside said housing; and

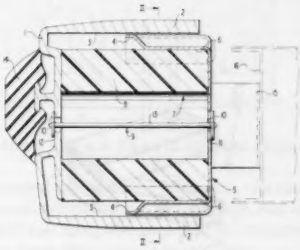
d) a vibratory motor, connected to the other end of said shaft, for vibrating said shaft in a predetermined plane.

4,085,956

BUMPER CONSTRUCTED AS AN ELASTOMERIC HOLLOW SPRING

Helmut Weisshappel, Sindelfingen; Wolfgang Klie, Korntal, and Wolfgang Fischer, Leinfelden, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 26, 1976, Ser. No. 670,905
Claims priority, application Germany, Mar. 27, 1975, 2513589
Int. Cl.² B60R *19/06*
U.S. Cl. 293—86 **17 Claims**



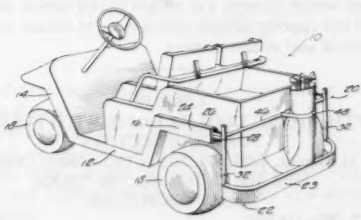
1. A shock absorber constructed as an elastomer hollow spring which is arranged between a vehicle bumper with sections directed toward the vehicle and a fixed vehicle part and which is supported thereat under prestress, characterized in that the shock absorber includes at its end near the vehicle a C-shaped frame-like means receiving said shock absorber and having an inner surface area abutting at the shock absorber and an outer surface area abutting at the inner sides of the sections of the bumper directed toward the vehicle, and wherein first means are provided for securing said frame-like means and said shock absorber to said bumper, and second means are provided for securing said frame-like means to said fixed vehicle part.

4,085,957

BUMPER DEVICE FOR A VEHICLE

Charles E. Hines, and John L. Stransky, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 24, 1976, Ser. No. 669,715
Int. Cl.² B60R *19/04*
U.S. Cl. 293—88 **5 Claims**



1. A vehicle comprising a vehicle frame including a pair of laterally spaced channel members respectively having a pair of spaced generally horizontal walls, said frame supporting a wheel and tire assembly, a bumper including a pair of laterally spaced bracket members having end portions, horizontally extending pivot means respectively pivotally connecting said end portions within said channel members, and yielding means for retaining said bumper at a first position with respect to said vehicle frame during normal vehicle operation, said yielding means comprising a pair of rubber blocks respectively positioned within said channel members for engagement with one of said horizontal walls and one of said pivotally connected

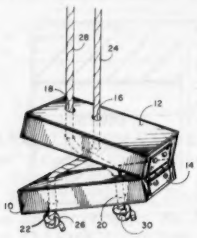
end portions, said rubber blocks being yieldable to afford displacement of said bumper from said first position into said wheel and tire assembly in response to collision of said bumper with an object.

4,085,958

FLUE LINER HANDLING DEVICE

Robert Gaudette, 35 Granite St., Biddeford, Me. 04005

Filed Mar. 30, 1977, Ser. No. 783,068
Int. Cl.[2] B66C *1/44*
U.S. Cl. 294—97 **4 Claims**



1. A device for the raising and lowering of a chimney flue liner pipe within a chimney comprised of:

a wedge element having a wedge element rope aperture defined centrally therein and a wedge element lowering rope aperture defined toward one end of said wedge element;

a release element having a release element lowering rope aperture defined centrally therein and a release element release rope aperture defined toward one end of said release element;

a lowering rope which passes through said release element lowering rope aperture of said release element and through said wedge element lowering rope aperture of said wedge element and is fastened to said wedge element by fastening means;

a release rope passing through said release element release rope aperture of said release element and through said wedge element release rope aperture of said wedge element and is fastened to said wedge element by fastening means; and

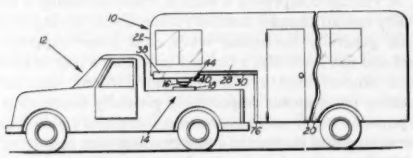
a hinge member affixed to said wedge element at its end opposite to said wedge element lowering rope aperture of said wedge element, and affixed to said release element at its end opposite to said release element release rope aperture of said release element.

4,085,959

FIFTH WHEEL TRAILER HOME WITH FOLDING FORWARD SECTION

Royal H. Dimick, 1357 NW. Scenic Dr., Albany, Oreg. 97321

Filed Sep. 27, 1976, Ser. No. 726,823
Int. Cl.[2] B62D *53/04*
U.S. Cl. 296—23 MC **8 Claims**



1. A travel trailer comprising;

(a) a body having a full height rear section and a vertically foreshortened forward section which is configured for extending over a towing vehicle for fifth wheel connection therewith,

(b) folding side walls and a front wall configured for extending the foreshortened forward section downward, providing full height throughout,

(c) hinges mounting said side walls and front wall to the forward section, allowing folding movement about horizontal axes between vertical living positions and horizontal travel positions, and

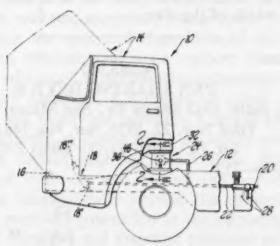
(d) a vertically movable floor located in the forward section of the trailer, and lifting means arranged for moving the floor between a raised travel position above the folding side walls and front wall, when in their travel positions, and a lowered living position adjacent to the lower margins of the side walls and front wall when in their living positions.

4,085,960

TILTING CAB LATCH MECHANISM

Clarence A. Sherman, Birmingham, Mich., assignor to Terry McDermid, Southfield, Mich.

Filed Jun. 1, 1976, Ser. No. 691,278
Int. Cl.[2] B62D *27/06*
U.S. Cl. 296—28 C **15 Claims**

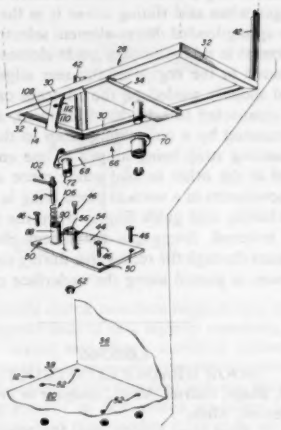


1. A latch mechanism for use with a tilting cab vehicle including a cab having a body member, a frame mounting the cab for tilting movement between access and use positions and having a frame member, said latch mechanism comprising: a keeper adapted to be mounted on one of said members; a base adapted to be mounted on the other of said members and defining a keeper opening for receiving the keeper when the cab is moved to the use position; a bolt movable on the base between latching and non-latching positions so as to engage or disengage the keeper in a manner that latches the cab in the use position or allows movement thereof to the access position; a cylinder on the base defining a cylinder bore and including a piston sealingly slidable within the bore; said piston having a first side including a connecting rod portion extending therefrom and fixedly mounting the bolt; the piston having a second side that faces in the opposite direction as the first side and includes a depression extending within the piston toward the connecting rod portion thereof; a seal located intermediate the first and second sides of the piston so as to slidably seal with the cylinder; a helical spring having a first end seated by the cylinder and a second end seated within the depression in the second side of the piston so as to bias the piston in a direction that moves the bolt to the latching position; and a fluid port for selectively feeding fluid to the cylinder bore on the first side of the piston such that the piston slides against the bias of the spring to move the bolt to the nonlatching position and thereby releases the keeper to permit the cab to be moved to the access position.

4,085,961
TOOL BOX MOUNT FOR PICKUP TRUCK

Manuel D. Brown, 21855 Walnut Ave., Riverdale, Calif. 93627

Filed Jun. 17, 1976, Ser. No. 696,842
Int. Cl.² B65D *43/16*
U.S. Cl. 296—37.6 7 Claims



1. A tool box mount for a pickup truck, comprising, in combination:

(a) a frame arranged for supporting a tool box; and

(b) support means connected to the frame for attaching the frame to a bed of a pickup truck and permitting the frame to swing over the bed between a first position and a second position, the support means including in combination:

(1) base means anchorable to the bed of a pickup truck;

(2) arm means rotatably connected both to the base means and to the frame for swinging the frame between the first position and the second position; and

(3) lock means mounted on the base means and selectively engageable with the arm means for retaining the frame in one of the first position and the second position, with the frame means including a framework which lies in a single plane, is rectangular in plan, and includes a longitudinal element disposed bisecting the framework, the arm means being connected to the longitudinal element, with the first position being when the longitudinal element is perpendicular to an adjacent side of the bed of the truck, and the second position being when the longitudinal element is perpendicular and adjacent to a rear edge of the bed of the truck, with the side wall and rear edge being disposed at substantially right angles with respect to one another.

4,085,962
SEAT ASSEMBLY

Robert A. Wahls, McHenry, Ill., assignor to The Freedman Seating Company, Evanston, Ill.

Filed Sep. 13, 1976, Ser. No. 722,681
Int. Cl.² B60N *1/10*
U.S. Cl. 296—65 R 13 Claims

1. A seat assembly for a vehicle, said seat assembly comprising:

a base,

said base being anchored to the floor of said vehicle;

at least one seat on said base,

said seat including a seat frame,

said seat further including a back,

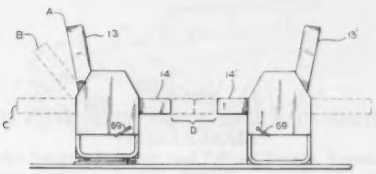
said back including a back frame,

said back frame being pivotally associated with said seat frame whereby the rake of said back frame with respect to said seat frame is variable;

means to selectively recline said back frame with respect to said seat frame, and to maintain a selected attitude of rake of said back frame with respect to said seat frame;

means to extend said seat frame with respect to said base,

said seat extension means including means to telescopically cooperate with said base;



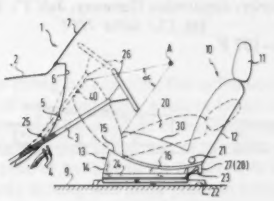
means to mount said seat frame to said seat extension means; and

means to control said reclining means and said seat extension means to selectively adjust and maintain said rake and to allow said seat extension means to be operated to move said seat frame with respect to said base.

4,085,963
SAFETY SEAT FOR VEHICLES

Heinz H. Bullerdieck, Friederickh-Ebert-Str. 41, D-3500 Kassel, Germany

Filed Nov. 26, 1975, Ser. No. 635,510
Claims priority, application Germany, Nov. 27, 1974, 2456028
Int. Cl.² B60R *21/10*
U.S. Cl. 296—65 A 9 Claims



1. A safety seating arrangement for motor vehicles comprising in combination:

(a) a seat having a safety belt associated therewith,

(b) a supporting base for said seat,

(c) a first sliding member attached to the bottom of said seat, said first sliding member being convex in a downward direction,

(d) a second sliding member attached to an upper portion of said supporting base, said second sliding member being concave in an upward direction, said first and second sliding members both having smooth-faced matching surfaces so as to permit sliding movement therebetween,

(e) driving means for rapidly moving said first sliding member relative to said second sliding member so that the seat can assume an inclined safety position,

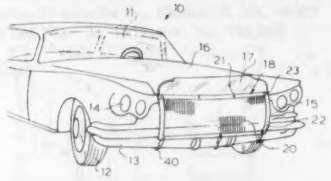
(f) means for activating said driving means, and

(g) braking means for progressively retarding said first and second sliding members when moved relative to each other.

4,085,964
VEHICLE INSECT PROTECTION APPARATUS

Ernest L. Hutto, 608 Lillian Dr., Orlando, Fla. 32806, and Charles A. Tovey, 1660 Cheyenne Trail, Maitland, Fla. 32751

Filed Sep. 13, 1976, Ser. No. 722,827
Int. Cl.[2] B60J *1/20;* B60K *11/04*
U.S. Cl. 296—91 7 Claims



1. A vehicle insect protection apparatus having an air current deflector shield attachable to the hood of a vehicle by an elongated bracket extending transversely to and under a front lip of a vehicle hood, the improvement comprising:

a flexible mesh screen shaped to fit over a portion of the front end of a vehicle and having at least two flexible reinforcing edges on the periphery thereof;

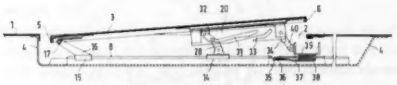
fastener means having a plurality of portions thereof attached to said air current deflector shield bracket and a plurality of mating portions attached to one said flexible screen reinforcing edge at predetermined positions thereon;

a plurality of flexible, strap bumper fasteners attached to a second said flexible reinforcing edge for attaching said screen to a bumper of a vehicle whereby a rapidly attaching insect screen may be attached to an existing air deflector.

4,085,965
SLIDING ROOFS FOR AUTOMOBILES

Albert Schlapp, Sprendlingen, Germany, assignor to American Sunroof Manufacturing Company, Southgate, Mich.

Filed Jul. 16, 1976, Ser. No. 705,956
Claims priority, application Germany, Jul. 18, 1975, 2532187
Int. Cl.[2] B60J *7/04*
U.S. Cl. 296—137 F 8 Claims

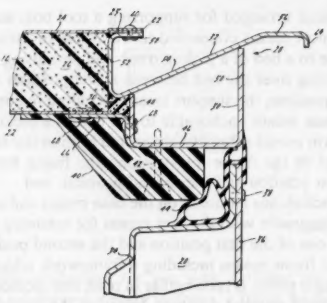


1. a sliding roof for an automobile having a fixed roof surface with an opening thereon, having a rigid sliding cover, guide rails mounted laterally of the opening in the fixed roof of the automobile extending in the sliding direction of the cover, forward and rear sliding shoes mounted on said guide rails for guiding said cover, guided thrust-transmitting cables engaging said rear sliding shoes for driving said cover, pivot bearings mounted on the forward sliding shoes for journalling said cover to pivot about a horizontal axis extending transversely to the direction of sliding, guide blocks attached to said cover along the lateral edges thereof, and guide pins mounted on said rear sliding shoes engageable with said guide blocks, so that the sliding cover, starting from its closed position, can either be swung upwards like front-hinged ventilator flaps by raising the rear edge thereof above the fixed roof surface of the automobile, or, after the rear edge thereof has been lowered, can be slid underneath the fixed roof surface of the automobile to the rear of the opening therein, whereby a force connection exists between parts attached to the sliding cover and stationary parts which prevents sliding of the cover in the direction of an opening movement while the sliding cover is being swung in from a swung-out position into its closed position, the improvement comprising a guide finger attached to the sliding cover in the vicinity of the rear edge thereof and extending transversely to the sliding direction thereof, a stationary guide element means constituting an integral portion of one of said rails for slideably guiding the cover and extending in the direction of sliding and having a recess therein located adjacent to said guide finger when said sliding cover is in the closed position thereof, a spring-loaded detent element selectively engageable with the recess in said stationary guide element means, a guide piece situated in the region of the rear edge of said sliding cover and slidably guided on the adjacent one of said guide rails and connected to said detent element, said guide piece being connected by a connecting strap to the sliding cover, said connecting strap being hinged at one end to the sliding cover and at the other to said guide piece so as to execute pivotal movements in a vertical plane lying in the direction of sliding, whereby said guide finger, when the rear edge of the cover is lowered, disengages the detent element from the recess, passes through the recess and, during subsequent sliding of the cover, is guided along the underface of the guide element.

4,085,966
DOOR HEADER CONSTRUCTION

Stephen J. Ringe, Detroit, Mich., assignor to Fruehauf Corporation, Detroit, Mich.

Filed Nov. 4, 1976, Ser. No. 738,851
Int. Cl.[2] B60J *1/00*
U.S. Cl. 296—146 7 Claims



1. A combination door header and rain gutter comprising a generally U-shaped member having vertically extending inner and outer leg portions connected by a horizontal bight portion, said outer leg portion having a greater vertical dimension than said inner leg portion, and a second member secured to the ends of said leg portions, said second member having an upwardly rearwardly inclined central web portion, a vertical flange at the inner end thereof, and an outwardly extending generally horizontal flange at the outer end thereof, the central portion of said second member forming a closed box section with said U-shaped member to define said door header, the vertical flange and the central web portion of said second member defining said rain gutter.

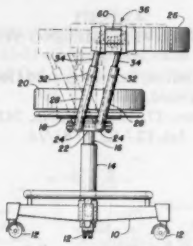
4,085,967
OPERATORY STOOL WITH CLUTCH FOR REST MEMBER

Bruce J. Spencer, Spring Grove, Pa., assignor to Dentsply Research & Development Corporation, Milford, Del.

Filed Aug. 3, 1977, Ser. No. 821,267
Int. Cl.[2] A47C *13/00*
U.S. Cl. 297—115 11 Claims

1. A stool having a seat supported by depending means engageable with a floor-like supporting surface, an arcuate rest

member positioned above said seat and substantially parallel thereto, and a pair of upstanding parallel support members for said rest pivotally interconnected at the opposite ends thereof respectively to said seat and rest for laterally adjusted positioning of said rest relative to said seat, in combination with position retaining means between said rest and arms comprising: a



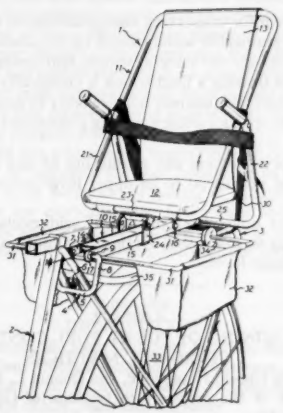
pair of co-engageable clutch members respectively connected to said rest and upper ends of said support members, pressure means normally urging said clutch members releasably into clutching engagement, and manually operable actuating means connected to one of said clutch members and operable to effect sufficient disengagement of said clutch members to permit lateral movement of said rest member relative to said seat.

4,085,968

BICYCLE CHAIR FOR CHILDREN

Sven Arne Svensson, Bastad, and Bengt Ebbe Oscar Ebbeson, Halmstad, both of Sweden, assignors to Origoverken I Halmstad AB, Halmstad, Sweden

Filed Jul. 2, 1976, Ser. No. 702,290
Claims priority, application Sweden, Jul. 7, 1975, 7507749
Int. Cl.[2] A47D *1/10*
U.S. Cl. 297—243 **9 Claims**



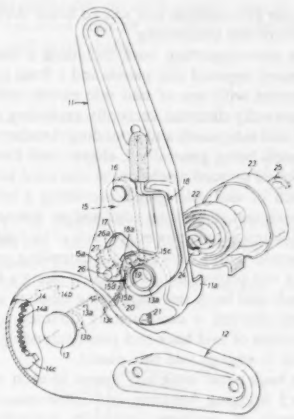
1. A bicycle chair for children, having a mounting for fixing the chair on the bicycle, said mounting comprising a substantially U-shaped stirrup having a web, a bracket secured to said web for connection to the bicycle, said stirrup having bent ends in register with each other, and having a frame which is to abut against the luggage carrier of the bicycle and supports a rack, for a seat and the back support, said frame comprising a longitudinal, centrally located beam and two arms placed adjacent each longitudinal side of the beam and pivotally connected thereto, the arms projecting ahead of the beam and having, at their projecting ends, holes for receiving the registering ends of the stirrup, wherein the mounting is adapted to be fixedly mounted on the bicycle in a position immediately ahead of the luggage carrier, and wherein the frame also forms a locking device for releasable locking of the frame on the mounting.

4,085,969

HINGE FITTING FOR ADJUSTABLE BACK RESTS OF VEHICLE SEATS

Mototaka Nakane, Hekinan, and Takami Terada, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed Sep. 28, 1976, Ser. No. 727,421
Claims priority, application Japan, Oct. 7, 1975, 50-121463
Int. Cl.[2] B60N *1/02*
U.S. Cl. 297—367 **7 Claims**



1. In a hinge fitting for adjusting the inclination of the back rest of a vehicle seat, comprising a pair of hinge plates pivotably connected to each other, a first of said hinge plates adapted to be secured to one side of the seat or the back rest and the second hinge plate to one side of the back rest or the seat; and means for rigidly locking said hinge plates in different angular positions to each other;

the improvement wherein said locking means comprises

a semicircularly toothed internal rack secured within said first hinge plate;

a pawl lever swingably pivoted on said second hinge plate and including a detent element swingably meshed with the teeth of said rack in a vertical common plane and a lever portion integrally extended from said detent element via the backside of said rack, the pivot position of said pawl lever being arranged on an outer tangent of the semicircularly aligned teeth of said rack to provide linear engagement of said detent element with the teeth of said rack;

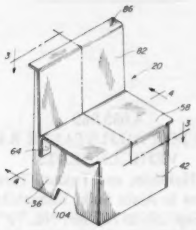
a locking lever pivoted coaxially with said hinge plates and movable between a locked position in which said detent element is engaged with the teeth of said rack by engagement of said locking lever against said detent element and an unlocked position in which said detent element is disengaged from the teeth of said rack by engagement of said locking lever against said pawl lever; and

means for biasing said locking lever to maintain the engagement of said locking lever with said detent element.

4,085,970
PAPERBOARD CHAIR OF UNITARY CONSTRUCTION

Sheldon D. Klein, Chicago, Ill., assignor to Chippewa Paper Products Company, Hillside, Ill.

Filed Jul. 21, 1976, Ser. No. 707,375
Int. Cl.[2] A47C *7/00*
U.S. Cl. 297—440 **2 Claims**



1. A chair of stiff corrugated paperboard and the like, comprising

a. a single pre-stamped and scored blank defining a unitary structure and comprising

(1) a seat-supporting base including a pair of laterally spaced opposed side panels and a front panel integrally formed with one of said side panels and connected to forwardly directed vertically extending forward edges of said side panels and extending therebetween, said side panels being generally L-shaped and having integrally formed upward extensions at rearward portions thereof, each of said side panels providing a horizontally disposed seat supporting edge and an upwardly projecting back rest supporting edge, each of said side panels being formed with a downwardly extending upwardly opening slot projecting into the side along a line defined by each said back rest supporting edge as a virtual extension thereof, a downwardly directed lower marginal portion of said back rest panel extending into each said slot to engage said side panels,

(2) a back panel integrally joined to each said side panels and bridging between and interconnecting said side panels at rearmost vertically extending extremities thereof,

(3) a seat panel integrally formed with and hingedly connected to a top edge of said front panel along a horizontally extending fold line formed at a juncture of said front panel and said seat panel, said seat panel being pivotal rearwardly at said fold line to abut, bear upon, and to cover said horizontally-disposed seat-supporting edge of each of said side panels,

(4) a back rest panel integrally formed with and hingedly connected to said back panel along a scored hinge line at a juncture of an upper edge of said back panel with said back rest panel, said back rest panel being pivotal forwardly and downwardly about said hinge line generally to overlie said back panel and to abut and cover said back rest supporting edge of each of said upward extensions of said side panels, and

(5) a laterally extending locking flange integrally formed with said seat panel at a rearward terminus thereof and joined to said seat panel along a laterally extending fold line, said locking flange being adapted to project downwardly into and to engage within the slot in each of said side panels and contiguously to abut said lower marginal portion of said back rest panel, thereby to lock said seat panel and said back rest panel firmly in place; and

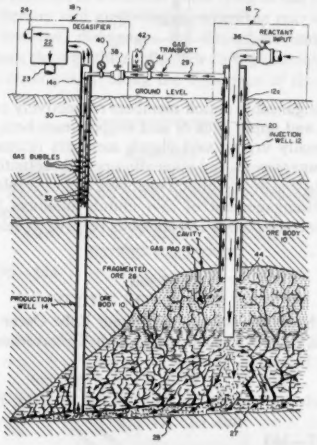
b. a seat-supporting vertical wall generally V-shaped in horizontal section and defining a unitary structure separate from said blank, said wall being disposed as an auxiliary strut within said base of said chair beneath said seat panel, said wall having a height equal to the height of said side panels at each seat supporting edge thereof,

whereby, as said seat panel bears upon said seat-supporting edge of each of said side panels, said seat panel also abuts a top edge portion of said wall to constitute an auxiliary weight-bearing support for said seat panel.

4,085,971
ENERGY CONSERVING MINING SYSTEM AND METHOD

Charles H. Jacoby, Dalton, Pa., assignor to Occidental Minerals Corporation, Lakewood, Colo.

Filed Nov. 17, 1976, Ser. No. 742,632
Int. Cl.[2] E21C *41/14*
U.S. Cl. 299—4 **35 Claims**



1. A system for conserving energy incidental to in situ mining a fluid permeable underground cavity confined ore body containing sought-for mineral values, said system comprising:

means for flowing a fluid which is chemically reactive with said mineral values into said ore body to produce a soluble mineral product while evolving pressurized gas incidental to the reaction(s);

means for collecting and raising out of said ore body said mineral product(s) to an upper level processing facility; and

means for collecting portions of said evolved gases and utilizing them to assist in raising said mineral product(s) to said upper level.

4,085,972
SITU MINING OF FOSSIL FUEL CONTAINING INORGANIC MATRICES

Sambhunath Ghosh, Homewood, and Donald L. Klass, Barrington, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed May 25, 1977, Ser. No. 800,357
Int. Cl.[2] C12B *1/00*; E21B *43/22*; E21C *41/10*
U.S. Cl. 299—7 **10 Claims**

1. A process for recovering underground fossil fuel deposits retained in an inorganic matrix comprising:

contacting said deposit with an aqueous medium of anaerobic organisms under mesophilic or thermophilic temperature conditions for a time sufficient to produce particles of said deposit of a size capable of forming a slurry with said aqueous medium;

pumping said aqueous slurry containing said organisms and particulates of organic fossil fuel and inorganic matrix to the ground surface;

separating said particulates from the aqueous medium of anaerobic organisms, the particulates being further processed to separate the organic carbon and hydrocarbon component from the inorganic matrix; and

recycling said aqueous medium of anaerobic organisms to the underground fossil fuel deposit for further production of particles of said deposit.

4,085,973

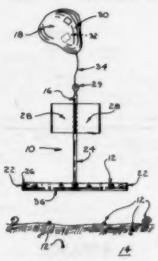
OCEAN FLOOR SURFICIAL DREDGING APPARATUS

John C. Payne, 23-51-32 St., Long Island City, N.Y. 11105

Filed Oct. 27, 1976, Ser. No. 736,226

Int. Cl.[2] E21C *45/00*

U.S. Cl. 299—8 **7 Claims**



1. Surficial dredging apparatus for automatically and selectively retrieving a plurality of particulate minerals of at least predetermined size from on and embedded in the surface of the ocean seabed comprising first means for providing sufficient downwardly driving forces for enabling said first means to at least partially penetrate the ocean seabed and for receiving the particulate minerals therein; second means operatively connected to said first means and being actuable for providing sufficient positive buoyant force for extricating said first means from the seabed and for returning said apparatus toward the ocean surface; and third means operatively connected to said first means for permitting the passup of particulate minerals on and embedded in the seabed surface therepast into said first means whenever downwardly penetrating the seabed and for automatically and selectively trapping a plurality of particulate minerals of at least predetermined sizes in said first means whenever said first means in being extricated from the seabed and ascending towards away from the ocean floor in response to actuation of the said second means, said second means is comprised of an inflatable member connected to the tubular member and upon actuation providing a sufficient positive buoyant force for extricating the first means and said third means from the seabed, wherein said positive buoyant force is less than the downwardly driving force of the first means.

4,085,974

DRUM CUTTER

Willy Lanfermann, Bochum; Friedhelm Henrich, Bochum-Weitmar, and Klaus Oberste-Beulmann, Sprockhovel, all of Germany, assignors to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed Mar. 23, 1977, Ser. No. 780,526

Claims priority, application Germany, Mar. 25, 1976, 2612671

Int. Cl.[2] E21C *25/08*

U.S. Cl. 299—53 **11 Claims**

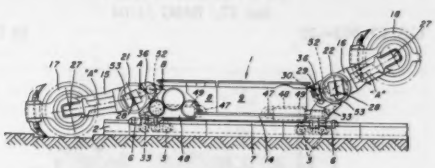
1. A drum cutter to release coal from a mine face while traveling along a mine floor, said drum cutter including the combination of:

a machine body including a pivot shaft at each of opposed ends thereof, the pivot shafts extending parallel to the mine floor at right angles to the direction of travel by the machine body therealong,

two support arms each having two laterally-spaced bores at one end thereof extending transversely to the extended length of the support arm, each bore in the end of each support arm being adapted to selectively receive a pivot shaft at one end of the machine body for pivotal support thereby,

a lever releasably mounted onto each of said support arms adjacent the ends thereof having said space bores,

a cutter drum projecting from the free end of each of said



two support arms at the coal side of the machine body for releasing coal from the mine face,

jack means supported by said machine body and operatively coupled to a lever for pivoting a support arm to position a cutter drum supported thereby, and

motor means supported on each support arm at the stow side, the extended ends of the motor means being supported to said pivot shafts.

4,085,975

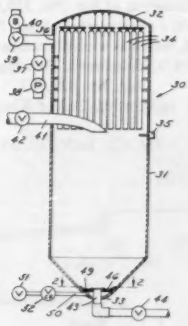
AERATING BARGE UNLOADING SYSTEM

Ib Bentzen Bilkvist, Ann Arbor, Mich., assignor to Dundee Cement Company, Dundee, Mich.

Filed Jul. 29, 1976, Ser. No. 709,846

Int. Cl.[2] B65G *53/26*

U.S. Cl. 302—23 **2 Claims**



1. In a method for filling a reloader with dry bulk particulate material under the influence of a vacuum and thereafter emptying said reloader of said dry bulk particulate material by air pressure, from a blower, the improvement of:

filling said reloader with dry bulk particulate material; and

simultaneously introducing air into said reloader during said filling step at a different location than the filling said reloader with dry bulk particulate material, said air being at a greater pressure than the air inside said reloader for mixing said air and said dry bulk material to form a homogenous mixture in said reloader;

whereby said homogenous mixture flows at a faster rate under the influence of said blower to empty said reloader.

4,085,976

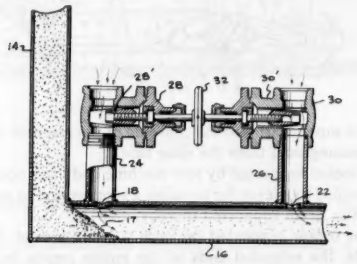
PULVERULENT MATERIAL METERING AND DELIVERY SYSTEM AND METHOD

Joseph Franklin Edwards; Johnny Milton Brown; James Vernon Christian, all of Kingsport, and Clayton Elkins, Jonesboro, all of Tenn., assignors to General Shale Products Corporation, Kingsport, Tenn.

Division of Ser. No. 636,649, Dec. 1, 1975. This application Sep. 27, 1976, Ser. No. 726,756

Int. Cl.[2] B65G *53/04*

U.S. Cl. 302—25 16 Claims



1. A method of providing a metered flow of finely powdered coal into a combustion chamber, said method consisting of the steps of providing a surface of repose of said finely powdered coal oriented at approximately 45° from horizontal, causing an ambient air stream to move substantially downwardly to continuously impinge upon said surface of repose to entrain coal particles therefrom and conveying said removed coal particles and the air from said air stream into said combustion chamber.

4,085,977

FEEDING OF FIBROUS MATERIAL TO CARDING MACHINES

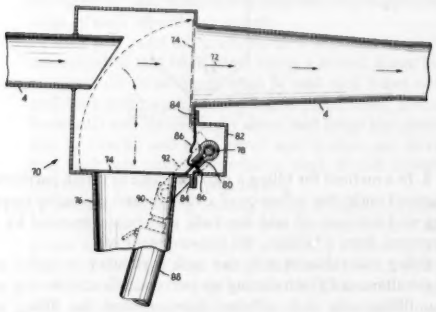
John Maximilian Jules Varga, Halifax, England, assignor to Carding Specialists Co. Limited, England

Continuation of Ser. No. 620,348, Oct. 8, 1975, abandoned, which is a continuation of Ser. No. 530,828, Dec. 9, 1974, abandoned, which is a continuation of Ser. No. 426,956, Dec. 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 114,764, Feb. 12, 1971, abandoned. This application Sep. 1, 1977, Ser. No. 829,953

Claims priority, application United Kingdom, Feb. 12, 1970, 6818/70

Int. Cl.[2] B65G *53/06*

U.S. Cl. 302—28 11 Claims



1. A method for feeding agglomerated fibrous material to a chute for feeding a carding machine through at least one duct having a preselected cross sectional area comprising the steps of generating a flow of moving air in said duct, preselecting the air flow rate and feeding said material at a selected rate to provide not less than 0.022 pounds of said material per cubic foot of air used, whereby said cross sectional area, said air flow rate and said feeding rate are selected so that said material is pushed or pulled along said duct and not suspended.

10. In a pneumatic transport system of the type having at least one chute and a duct for feeding fibrous material to said chute comprising a flap mounted in a C-clamp, means for pivotally mounting said flap inside said duct for pivoting between a first position in which said flap is positioned to deflect said material into said chute and a second position in which said flap is positioned to close said chute to said material, said means for pivotally mounting said flap comprises a pivot pin, said C-clamp being fixedly mounted to said pivot pin, and at least one flexible member mounted in said duct for covering said means for pivotally mounting said flap to prevent the entry of said fibrous material to said means for pivotally mounting said flap.

4,085,978

VEHICULAR HYDRAULIC BRAKE APPARATUS

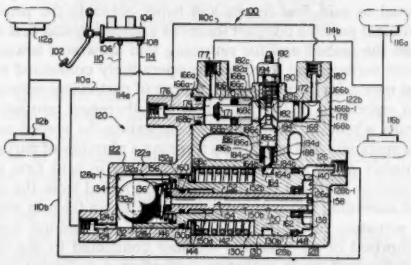
Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1977, Ser. No. 793,758

Claims priority, application Japan, Nov. 24, 1976, 51-140928

Int. Cl.[2] B60T *8/04*

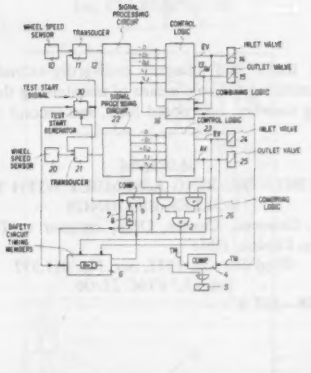
U.S. Cl. 303—6 C 10 Claims



4,085,979
TESTING ARRANGEMENT FOR ANTILOCKING CONTROL SYSTEM WITH TWO IDENTICAL ANTILOCKING CONTROL UNITS

Heinz Leiber, Leimen; Jürgen Gerstenmeier, Ngm-Waldhilsbach, and Hermann Klotz, Schwetzingen, all of Germany, assignors to Teldix GmbH, Heidelberg, Germany

Filed Apr. 1, 1977, Ser. No. 783,734
Claims priority, application Germany, Apr. 1, 1976, 2614016
Int. Cl.[2] B60T 8/00
U.S. Cl. 303—92 10 Claims

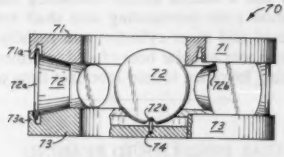


1. In an antilocking control system for wheel brakes of a vehicle, said system including two identically designed antilock control units for various wheels of the vehicle with each said control unit comprising at least one sensor for providing an output signal indicative of the rotational behavior of an associated vehicle wheel, an evaluation circuit means responsive to the output signal from said sensor for providing output control signals, and a brake pressure control means responsive to the output control signals from said evaluation circuit means for varying the brake pressure at the wheel brake of the associated wheel to prevent locking of same; and test circuit means for testing the operability of said antilocking control system at certain time intervals; the improvement wherein said test circuit means comprises: signal generating means responsive to a start instruction for simultaneously feeding at least one identical test signal to each of said two antilock control units; and interrogation and testing means for determining the effect of said test signal on each of said two antilock control units by comparing output signals from given corresponding points in each of said antilock control units for at least approximate coincidence with respect to the timely occurrence and/or magnitude of an output signal and for generating an output control signal if there is a deviation between the two signals being compared which is greater than a given value, whereby said output control signal from said interrogation and testing means may be used to switch off said antilocking control system and/or provide a warning indication, said interrogation and testing means including a separate logic circuit associated with each of said control units for linking the signals generated at various points of the associated control unit as a result of the input test signal in a manner so that a sequence of logic "O" and "L" signals is produced, the presence of which at a given point in time after feeding in the input signal is characteristic for the creation and/or disappearance of certain signals in the various points of said control units, and a comparison circuit means for comparing the two signal sequences generated by said logic circuits for coincidence.

4,085,980
TOOTHED ROLLING CONTACT DEVICES

Earl W. Traut, 8040 Palm Lake Dr., Orlando, Fla. 32811

Division of Ser. No. 437,937, Jan. 30, 1974, Pat. No. 3,998,506.
This application Dec. 13, 1976, Ser. No. 750,257
Int. Cl.[2] F16C 33/36
U.S. Cl. 308—205 1 Claim

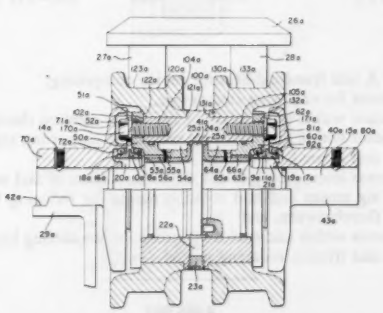


1. A rolling contact bearing comprising only:
two bearing races,
said bearing races being circular,
one rotating means,
said rotating means including a plurality of rollers,
one projection on each said race,
one notch in each said roller,
said projections engaging said notches as said rollers roll against said races,
said projections and said notches serving to maintain constant spacing between said rollers.

4,085,981
TRACK ROLLER DEVICE

Hideo Takenaka, 16-10, Kugahara 6-chome Ohta-ku, Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 710,404
Claims priority, application Japan, Aug. 15, 1975, 50-112048[U]
Int. Cl.[2] F16C 13/00, 33/74, 35/02
U.S. Cl. 308—20 5 Claims



1. A track roller device, comprising: a shaft; a pair of axially spaced-apart inner cylinders rotatably supported on said shaft, said inner cylinders each having a radially outwardly extending flange at the axially outer end thereof; an intermediate cylinder surrounding said pair of inner cylinders with its opposite axial ends being disposed in confronting relationship to said flanges and being secured thereto for rotation therewith, said intermediate cylinder having an annular radially outwardly projecting boss at about the axial midpoint thereof; a pair of separate rollers sleeved on said intermediate cylinder on axially opposite sides of said boss with each roller being disposed in association with one of said inner cylinders, said rollers each having an enlarged internal cylindrical recess in the axially outer side thereof and a radially extending end wall at the inner end of said recess, said end wall of said roller

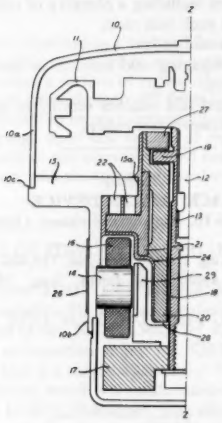
abuttingly engaging the flange of its associated inner cylinder so that said roller is retained on said intermediate cylinder by said flange, and the opposite axially inner sides of said rollers abutting against the opposite sides of said annular boss whereby said rollers are clamped between said flanges and said boss; cooperating wall means defining a pair of lubricant flow passages which respectively extend between said intermediate cylinder and one of said inner cylinders and have a first branch extending radially inwardly to between said shaft and said inner cylinder and a second branch extending axially into a sealed lubrication zone surrounding said shaft and disposed axially outside of said inner cylinder; and radially extending passage means in said annular boss of said intermediate cylinder for supplying lubricant to said lubricant flow passages.

4,085,982

SEAL FREE LIQUID BEARING

Bo Hans Gunnar Ljung, Wayne, N.J., assignor to The Singer Company, Little Falls, N.J.

Filed Sep. 27, 1976, Ser. No. 726,895
Int. Cl.[2] F16C *37/00*
U.S. Cl. 308—76 **12 Claims**



5. A seal free fluid bearing device comprising:
means for enclosing said device,
means within said enclosing means for rotation therein,
means within said enclosing means for supporting said rotation means,
means interposed between the inner surface of said supporting means and said rotation means for reducing friction therebetween, and
means within said enclosing means for conducting heat from said friction reducing means.

4,085,983

SWIVEL THRUST BEARING

Carl B. Johnson, Pontiac, Ill., assignor to Pontiac Furniture Industries, Inc., Pontiac, Ill.

Filed May 6, 1976, Ser. No. 683,901
Int. Cl.[2] F16C *11/00, 27/06*
U.S. Cl. 308—134.1 **6 Claims**

1. A thrust bearing comprising a flat ring member, a lubricating liner embracing the inner periphery of said ring member and both sides thereof adjacent to said inner periphery, and a second member having an annular surface in contact with said liner in facing relation to one side of said ring member, said second member having an integral neck portion extending through the central apertures of said ring member and liner and having integral ledge means extending radially outwardly from said neck portion in contact with the liner on the opposite side of said ring member, said annular surface and ledge means enabling said second member to receive or transmit thrust in either axial direction from or to said ring member through the

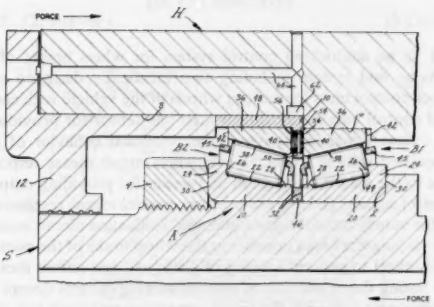
interposed liner, said integral outwardly-extending ledge means constituting the sole means of maintaining the assembly of said ring member, interposed liner, and second member.

4,085,984

DOUBLE ROW BEARING ASSEMBLY WITH TAPERED ROLLER BEARINGS

Robert W. Cameron, Canton, Ohio, assignor to The Timken Company, Canton, Ohio

Filed Jun. 30, 1977, Ser. No. 811,577
Int. Cl.[2] F16C *23/06*
U.S. Cl. 308—207 A **11 Claims**



1. A double row bearing assembly for supporting a structure such as a shaft within another structure such as a housing and being capable of accommodating thrust loading in both axial directions as well as radial loading; said bearing assembly comprising: a set of inner races positioned on the one structure with each inner race having an outwardly presented raceway; a set of outer races positioned on the other structure with each outer race having an inwardly presented raceway located opposite the outwardly presented raceways of the inner races, the races of one of the sets being fixed in position with respect to each other and the races of the other set being movable axially with respect to each other; rolling elements between the raceways of corresponding inner and outer races, whereby the rolling elements are arranged in two circumferential rows, the rolling elements of one of the rows and the raceways against which they are located being configured to accommodate thrust loading in one axial direction, the rolling elements of the other row and the raceways against which they are located being configured to accommodate thrust loading in the other axial direction; a spacer between the axially movable races and being fixed in position with respect to the structure along which those races are located so as to serve as an abutment for those races; and springs carried by the spacer and urging the movable raceways away from each other, whereby

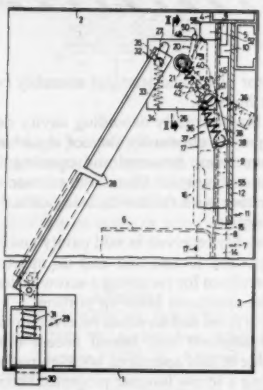
when a thrust load is applied in one axial direction, one movable race will be blocked by the spacer and the thrust load will maintain the rolling elements of that race seated against its raceway and the raceway of the corresponding fixed race for a full 360°, and the springs will urge the other movable race away from the spacer to the extent that the rolling elements along that movable race will remain seated against its raceway and against the raceway for the corresponding fixed race for a full 360°, and vice-versa when the thrust loading is applied in the other direction.

4,085,985

CENTRAL LOCKING MECHANISM

Michael Weber, Gaildorf-Unterrot, Germany, assignor to Wilhelm Bott KG, Gaildorf, Germany

Filed Oct. 7, 1976, Ser. No. 730,473
Int. Cl.² E05B *65/46*
U.S. Cl. 312—216 **8 Claims**



1. A central locking mechanism for an item of furniture having a plurality of drawers arranged side by side or one above the other comprising a blocking projection integral with each of said drawers and arranged transversely to the sliding direction of the respective drawer, a locking bolt extending beyond all of said drawers pivotable about a stationary axis into the path of movement of the blocking projections, said stationary axis extending parallel to the longitudinal axis of the locking bolt so that the closed drawers cannot be opened and said locking bolt, in the locked position of the central locking mechanism, being pivotable against the force of a spring out of the blocked position when an opened drawer is being closed, a driving member, a bistable member coupling said driving member and said locking bolt said locking bolt being connected to a lever arm which, in the unlocking position of the locking bolt, projects into the path of a stopping face on each said blocking projection so that the stopping face is engageable with the lever arm when opening a drawer and the locking bolt is pivotable into the locking position.

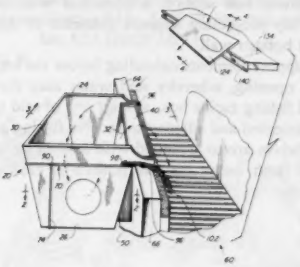
4,085,986

AUXILIARY REFRIGERATED DISPLAY CASE

Ronald H. Taub, Highland Park, Ill., assignor to Taub Family Trust U/A Sept. 1, 1967, Chicago, Ill.

Filed Sep. 22, 1976, Ser. No. 725,644
Int. Cl.² A47B *77/08*; A47F *3/04*; A47B *81/00*
U.S. Cl. 312—236 **5 Claims**

1. In the combination of an open top refrigerated display case constituting a primary case having a front wall and including refrigeration means for maintaining the interior of the primary case at a reduced temperature to promote safe storage of heat-sensitive items contained therein, with a secondary display case physically distinct from the primary case and positioned exteriorly thereto adjacent a front face of said front wall, said secondary case including a floor, a pair of opposed end walls, and front and rear walls defining an upwardly open chamber for storage and display of articles disposed therewithin at a reduced temperature, said secondary case being devoid of independent refrigeration means and there being no auxiliary air pump means or duct means associated with said secondary case; the improvement wherein said primary case further comprises air deflection means in a flow path of cool air emanating from the primary case for directing transfer of cool



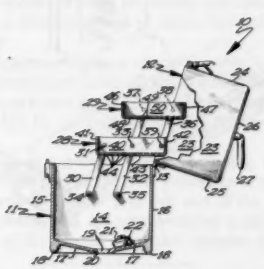
air from the interior of the primary case to the chamber of the secondary case, said air deflection means comprising a laterally-elongated, panel-like vane comprising a fixed attachment to said primary case, and means supporting said vane at a position above said secondary case and in proximity thereto, wherein said vane is supported by a shelf extending laterally in a zone generally above said primary display case and rearwardly of and in line with said secondary case, and said vane is angled to project upwardly and rearwardly with respect to said secondary case.

4,085,987

TACKLE BOX

Robert B. Vartdal, Drawer 9, Sanibel, Fla. 33957

Filed Mar. 29, 1976, Ser. No. 671,338
Int. Cl.² A47B *77/16*
U.S. Cl. 312—269 **1 Claim**



1. A fishing tackle box for use in conjunction with salt water fishing, comprising:

a generally rectangular shaped lower box section having opposed end walls, a front wall, a rear wall, and a generally upwardly concave bottom wall, said bottom wall extending downwardly and inwardly from said front wall, said rear wall and said end walls to a substantially central portion,

a drainage opening in said central portion,

a removable closure for said opening, attached to a portion of said lower section by a chain or the like,

a generally rectangular shaped upper box section defining

a cover for said tackle box and being hingedly connected to said lower box section for swinging movement between opened and closed positions,

a plurality of shelves pivotedly mounted on said lower box section by interconnecting arms and adapted to be enclosed between the upper and lower box sections,

each shelf including upstanding peripheral walls and a perforated bottom wall whereby when said tackle box is opened and the interior thereof sprayed with fresh water to clean the box and its contents said water will readily drain from the shelves through the perforate openings therein into the lower box section and through said central opening,

said lower box section is provided with integral downwardly projecting support elements at the periphery of said bottom wall,

said support elements extending below the top of said drainage opening, whereby said water may flow freely from said fishing tackle box, at least one of said shelves is compartmented and adapted to receive fishing gear or the like,

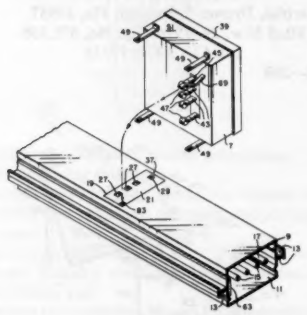
said shelves are so arranged with respect to each other, that said fresh water may be poured in each shelf independently.

4,085,988

BUS DUCT PLUG-IN GROUND STAB

Dennis H. Gamble, Brighton Township, Beaver County, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 27, 1977, Ser. No. 763,202
Int. Cl.² H01R *3/06*
U.S. Cl. 339—14 R **5 Claims**



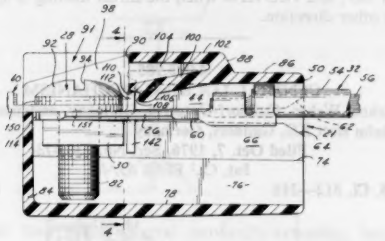
1. A multiphase electrical power distribution apparatus comprising a section of bus duct including top and bottom walls and opposite side walls forming a housing, a plurality of multi-phase bus bars supported within the housing, a ground bar mounted on a side wall of the housing, one of the walls having an outlet opening, a plug-in unit detachably mounted on the bus duct, the plug-in unit being a box-like member having a bottom wall, the bottom wall including an aperture aligned with the outlet opening when the plug-in unit is attached to the bus duct, the plug-in unit having electrically conductive means extending through the opening and detachably engaging the multi-phase bus bars, ground conductor means within and electrically connected to the plug-in unit and comprising a flexible conductor extending through the opening, and the conductor being biased in detachable contact with the ground bar in the bus duct.

4,085,989

CONNECTOR BLOCK AND TERMINAL ASSEMBLY

Willard B. McCardell, Royal Oak, Mich., assignor to Altair Tool & Engineering Inc., Mt. Clemens, Mich.

Filed Nov. 3, 1975, Ser. No. 628,073
Int. Cl.² H01R *9/16*
U.S. Cl. 339—59 M **12 Claims**



1. A connector block and terminal assembly comprising:

an insulating housing,

at least one longitudinally extending cavity defined by the housing opening outwardly thereof at one end to form a terminal receiving entrance and opening laterally outwardly thereof spaced from said entrance to form an access aperture with the cavity being closed intermediate said openings,

a terminal slidably received in said cavity and having a wire gripping portion at one end and an apertured hook-up portion therefrom for receiving a screw fastener projected through the apertured hook-up portion,

a nut separable from said terminal received in said cavity and positioned adjacent said lateral access opening on the opposite side of said apertured hook-up portion therefrom for receiving a screw fastener projected through the apertured hook-up portion,

means on said terminal for retaining said nut in the cavity in sufficient registry with the aperture in the hook-up portion independent of any screw fastener to enable screw threaded engagement of a screw fastener projected through the apertured hook-up portion, and

locking tang means on the housing for engaging the terminal to hold it in the cavity.

4,085,990

LONGITUDINALLY ACTUATED ZERO FORCE CONNECTOR

Max Leroy Jayne, North Warren, Pa., assignor to GTE Sylvania, Incorporated, Stamford, Conn.

Filed Mar. 25, 1977, Ser. No. 781,295
Int. Cl.² H01R *13/62*
U.S. Cl. 339—74 R **11 Claims**

1. A longitudinally actuated connector comprising:

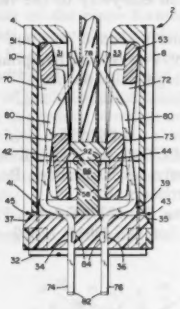
a hollow support member having two side walls which extend along the longitudinal axis of said member and are connected by two end walls;

at least one contact holder positioned within said support member and extending along said longitudinal axis, the internal surface of said holder including at least one cam follower and wherein said contact holder includes at least one edge portion extending along said longitudinal axis and at least one of said side walls includes a lip to provide pivot point;

at least one resilient electrical contact engaging said holder, said contact urging said cam follower toward said longitudinal axis; and,

at least one actuator plate slidingly affixed internal of said support member, said plate including at least one cam surface which engages said cam follower and includes a high point and a low point, said actuator plate extending

through an aperture in said support member to provide a portion outside of said support member by means of which said plate may be moved along said longitudinal axis, said movement forcing said contact holder and contacts engaging said holder away from said longitudinal axis by pivotal movement of the contact holder about said pivot



point as said high point approaches said cam follower and allowing said contact holder and contacts engaging said holder to move towards said longitudinal axis by pivotal movement of the contact holder about said pivot point in a reverse direction as said low point approaches said cam follower.

4,085,991

ELECTRICAL SOCKET

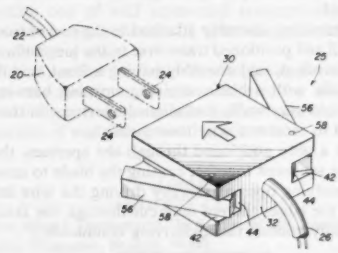
Bruce H. Marshall, 2256 W. Arthur Ave., Chicago, Ill. 60645, and Henry E. Blenner, 1515 E. Central Rd., Arlington Heights, Ill. 60005

Continuation-in-part of Ser. No. 745,531, Nov. 29, 1976. This application Apr. 21, 1977, Ser. No. 789,409

The portion of the term of this patent subsequent to Nov. 29, 1994, has been disclaimed.

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—75 P **14 Claims**



1. An electrical socket for interconnection with a male electrical plug having two spaced-apart prongs, respectively with apertures near the ends thereof, said socket comprising a body having a pair of spaced-apart channels therein respectively to receive the prongs of the male electrical plug, said body further having therein a pair of outwardly facing, oppositely directed recesses, a pair of electrical contacts in said body and respectively adjacent to said channels and in communication therewith, a pair of legs pivotally mounted on said body and movable between a locking position respectively in said recesses and respectively alongside said channels and an unlocking position respectively out of said recesses and respectively away from said channels, and a pair of fingers respectively carried by said legs and located thereon respectively to enter the apertures of the prongs when the legs are in the locking positions thereof and to be withdrawn from the apertures when the legs are in the unlocking positions thereof.

4,085,992

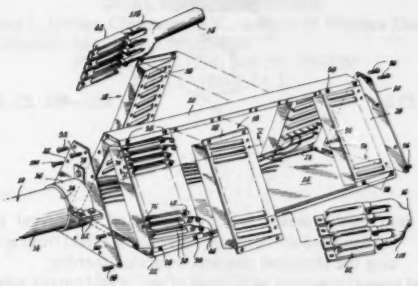
METHOD AND APPARATUS FOR CONNECTING MULTI-CONDUCTOR CABLES

George Edward Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Division of Ser. No. 448,476, Mar. 6, 1974, Pat. No. 3,958,850, which is a division of Ser. No. 248,595, Apr. 28, 1972, Pat. No. 3,820,056. This application Mar. 5, 1976, Ser. No. 664,125

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—91 R **5 Claims**



1. An assembly for physically and electrically connecting a first multi-conductor cable to a plurality of second multi-conductor cables, comprising:

at least three panels;

connecting means for joining said panels to form an enclosure for said first cable;

a plurality of first connector elements mounted in at least one of said panels, each of said connector elements having a selected group of first cable conductors physically and electrically connected thereto;

a plurality of second connector elements adapted to mate with said first connector elements, each of said second connector elements being physically and electrically connected to a selected group of conductors of said second cables; and

releasable engagement means operative when a second connector element is mated in a corresponding first connector element for preventing the elements from being spuriously separated but for permitting them to be separated if desired,

said releasable engagement means including a holddown secured at one end of the first connector element and at the other end to a point near one end of the second connector element, and a screw securing a point near the other end of the second connector element to said panel.

4,085,993

SEALED CONNECTOR WITH BARRIERS TO CONTACT BRIDGING

James L. Cairns, 16946 Cloudcroft Dr., Poway, Calif. 92064

Filed Sep. 7, 1976, Ser. No. 720,846

Int. Cl.[2] H01R *13/52*

U.S. Cl. 339—94 M **7 Claims**

1. In combination:

a plug having contacts to enter a receptacle and matingly engage contacts therein;

a receptacle including a housing having a chamber sealed by a slitted, self-sealing cap,

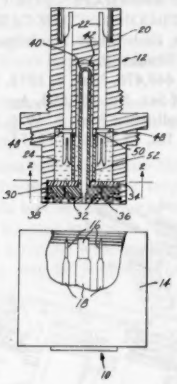
said chamber being filled with dielectric fluid;

a hollow flexible member integral with said cap extending into said chamber,

said cap having a central opening to expose the interior of said flexible member to the exterior of said housing;

electrical contacts spaced about said flexible member and secured in said housing opposite said cap;

respective barrier means extending from said flexible member and between each pair of said electrical contacts,



each barrier means being dimensioned to prevent any foreign conductive matter entering said fluid from spanning the electrical contacts separated thereby;

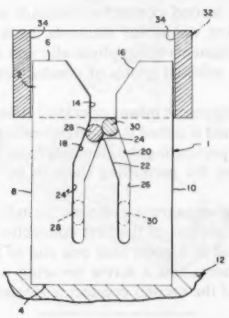
and means to prevent movement of any of said barrier means out of contact separating position.

4,085,994

DUAL SLOT CONTACT

Robert Volinskie, Hershey, Pa., assignor to AMP, Incorporated, Harrisburg, Pa.

Filed Aug. 12, 1976, Ser. No. 713,724
Int. Cl.² H01R *9/08*
U.S. Cl. 339—95 R **2 Claims**



1. A slotted plate electrical contact, comprising:

a single metal plate having a slot therein,

said slot including an initial slot portion and first and second diverging slot portions each having an entryway communicating with said first slot portion,

a portion of said plate having an apex between said diverging first and second slot portions,

said initial slot portion having a width greater than the diameter of a first or a second uninsulated, relatively small diameter wire to be connected electrically in said slot but less than the sum of diameters of said first and second wires,

said first and second diverging slot portions each having a width less than the diameter of a first or a second wire to be connected electrically in said slot, and a length greater than the diameter of a first or a second wire to be electrically connected in said slot,

said apex being so constructed and arranged for diverting a first wire to either side thereof into one said entryway of one of said diverging slot portions, whereby a first wire is detained in one said entryway, and

a second wire is diverted by a first wire detained in one said entryway into an entryway of the remaining diverging slot portion,

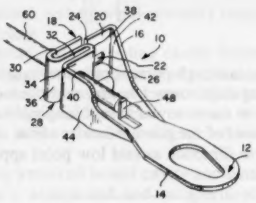
whereby a first and a second wire are positioned respectively in said entryways for corresponding wire termination in said diverging slot portions.

4,085,995

ELECTRICAL TERMINAL

Stephan Douglas Kautz, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 27, 1977, Ser. No. 810,260
Int. Cl.² H01R *11/20*
U.S. Cl. 339—97 R **2 Claims**



1. An electrical terminal stamped and formed from a coplanar sheet of conductive material, comprising:

a. a connecting strip;

b. means at the front end of the strip for attachment to electrical connectors;

c. vertical side walls extending rearwardly from each side of the strip with the ends of the side walls being movable towards each other;

d. an insulation cutting blade attached to the end of one side wall and positioned transverse to the longitudinal axis of the terminal, said blade having a wire-receiving slot therein with the opening being towards the other side wall; and

e. a wire retaining assembly attached to the end of the other side wall and positioned transverse to the longitudinal axis of the terminal, said assembly having a front, middle and rear walls with a blade-receiving opening between the middle and rear walls, and aligned apertures in the walls adapted to receive a wire therethrough,

so that with a wire positioned through the apertues, the side walls may be squeezed together causing the blade to enter into the blade-receiving opening thereby driving the wire into the slot so that the edges thereof may cut through the insulation and electrically contact the underlying conductor.

4,085,996

CUBICAL THREE-CONDUCTOR ELECTRICAL TAP

Robert C. Koslo, Mentor, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 29, 1977, Ser. No. 782,414
Int. Cl.² H01R *13/50, 25/02*
U.S. Cl. 339—159 C **1 Claim**

1. An adapter device for converting a single three-conductor grounded electrical service outlet into three service outlets, said device comprising, in combination:

an integral one-piece housing of insulating material and having at least six sides thereof;

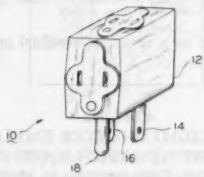
first and second line conductor terminals slidably inserted and mounted within said housing and respectively extending parallel to one another and from a pair of spaced-apart

openings on one surface of said housing, through said housing and projecting externally of said housing and away from a second surface which is opposite said one surface;

a first ground conductor terminal slidably inserted and mounted within said housing and extending from a third opening on said one surface through said housing, parallel to said first and second terminals, away from said housing and on one side of the plane formed by said first and second terminals in spaced-apart relationship therewith;

third and fourth line conductor terminals slidably inserted and mounted within said housing and respectively extending from a pair of spaced-apart openings on a third surface of said housing to a pair of openings on a fourth surface of said housing which is opposite to said third surface, said third and fourth line conductor terminals being parallel to one another and transverse to said first and second conductor terminals;

a second ground conductor slidably inserted and mounted within said housing and extending transversely of said first



ground conductor and between said third surface and a third opening on said fourth surface, said second ground conductor being spaced-apart from the plane formed by said third and fourth conductor terminals;

means for connecting said first and second ground connectors within said housing and for connecting said first and second line conductor terminals respectively with said third and fourth line conductor terminals, said means including an integral snap-in fastener on each of said conductors for retainingly engaging a mating fastener on the corresponding conductor to which each conductor is respectively connected, wherein the respective connected conductors are fixedly mounted within said housing by sliding one of said connected connectors into snap-in retaining engagement with the other of said connected conductors; and,

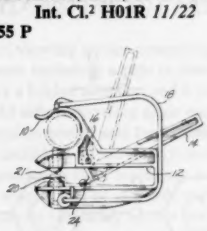
said third surface having a third opening therein which is spaced-apart from the plane formed by said third and fourth line conductors and which overlies an intermediate portion of said first ground conductor.

4,085,997

ANODIZE CLAMP

William Alfred Hainsworth, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 30, 1977, Ser. No. 782,805
Int. Cl.² H01R *11/22*
U.S. Cl. 339—255 P **8 Claims**



1. An apparatus for electrically connecting a part to be anodized to a conductor bar in an anodizing process which comprises:

a member adapted to attach to said conductor bar;

a frame disposed on said member for holding said part to be anodized;

means for slidably mounting an electrical conductor within said frame between said conductor bar and said part to be anodized; and

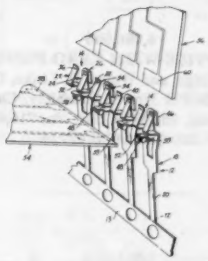
means for forcing said part to be anodized against the slidably mounted conductor for securing electrical contact between said conductor bar and said part to be anodized.

4,085,998

DUAL CLIP CONNECTOR

James L. Owens, Clemmons, N.C., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,399
Int. Cl.² H01R *13/12*
U.S. Cl. 339—258 P **6 Claims**



1. An electrical connector for interconnecting first and second electrical devices and coupling the interconnected devices to external circuitry comprising:

means for electrically coupling the connector to the external circuitry;

at least two resilient fingers in generally opposed spaced relationship for engaging and receiving the first electrical device therebetween; and

a projecting finger formed in an intermediate portion of the connector and extending in a given direction therefrom in generally opposed spaced relationship to a portion of one of the resilient fingers extending in the given direction from the intermediate portion of the connector, for engaging and receiving the second electrical device therebetween.

4,085,999

TRANSPARENT THERMAL INSULATING SYSTEM

Day Chahroudi, Kentfield, Calif., assignor to Energy Materials, Inc., Carte Madera, Calif.

Continuation of Ser. No. 471,767, May 20, 1974, Pat. No. 3,953,110. This application Apr. 8, 1976, Ser. No. 674,804
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.
Int. Cl.² F24D *5/00*; G02B *13/14*
U.S. Cl. 350—1.1 **14 Claims**

1. A thermal insulating system having controllable transmissivity to visible radiation comprising:

a first layer transmissive to visible radiation;

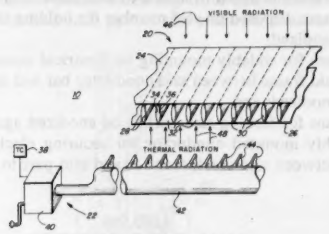
a second layer transmissive to visible radiation and spaced from said first layer;

means for defining the space between said layers into at least one compartment;

a thermal radiation suppressor device for suppressing thermal radiation transmission; and

a variable visible radiation control device including a contin-

uous, non-movable variable transmission layer whose opacity to visible radiation varies as a function of tempera-



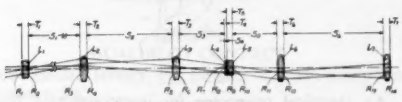
ture for controlling transmission of visible radiation as a function of temperature.

4,086,000

VIEWFINDER OPTICS WITH ZERO POWER DOUBLET

Arthur Cox, Park Ridge, and Walter R. Linke, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Aug. 23, 1976, Ser. No. 716,626
Int. Cl.[2] G02B *23/14*
U.S. Cl. 350—54 **6 Claims**



1. An optical system of a chromatically neutral viewfinder system, the system having:

an aperture stop;

positive elements spaced forward of said aperture stop;

positive elements spaced rearward of said forward elements and said aperture stop, the rearward elements including an eyepiece element; and

every one of the elements forwardly and rearwardly of said aperture stop having convex surfaces, no element forwardly or rearwardly of said aperture stop having a concave surface,

a hyperchromatic component which includes a chromatic aberration opposite to the chromatic aberration generated by said positive elements, the component being interposed along the optical axis substantially at the position of said aperture stop between said positive forward elements and said positive rearward elements

whereby said component chromatically neutralizes the image.

4,086,001

PLANAR OPTICAL WAVEGUIDE

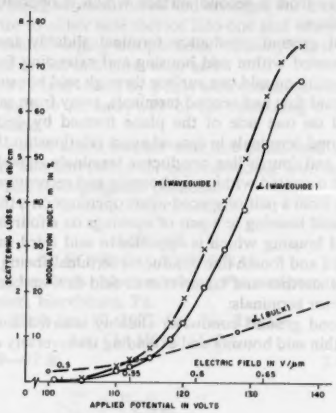
Di Chen, Minnetonka, and Barry G. Koepke, Burnsville, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 13, 1975, Ser. No. 540,919
Int. Cl.[2] G02B *5/14*
U.S. Cl. 350—96.14 **3 Claims**

1. A planar optical waveguide comprising:

a substrate having an index of refraction; and

a stress created planar optical waveguide region in contact with the substrate, wherein the waveguide region is formed by polishing the planar waveguide region having an index of refraction greater than the index of refraction



of the substrate as a result of residual stress within the waveguide region.

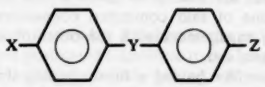
4,086,002

FIELD EFFECT LIGHT SHUTTER EMPLOYING LOW TEMPERATURE NEMATIC LIQUID CRYSTALS

Sardari L. Arora, Kent, Ohio, assignor to Haffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 223,310, Feb. 3, 1972, abandoned. This application Nov. 20, 1973, Ser. No. 417,501
Int. Cl.[2] C09K *3/34*; G02F *1/13*
U.S. Cl. 350—350 **4 Claims**

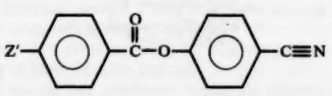
1. In a field effect liquid cyrstal display of the type in which a layer of liquid crystal material of positive dielectric anisotropy is sandwiched between transparent conductive electrodes; the improvement wherein said liquid crystal material comprises a mixture of at least three different liquid crystal compounds wherein in at least the first two of said compounds have the general formula:



wherein the radical Y comprises an ester linkage

and the X and Z radicals are selected from the group consisting of a saturated alkyl group having 1 to 18 carbon atoms and an alkoxy group having 1 to 18 carbon atoms, and the third of said compounds

has the general formula:



wherein the radical Z' is selected from the group consisting of

methyl and an alkoxy group having 1 to 18 carbon atoms and wherein the third of said compounds is present in the range of about 3 to 40 weight percent.

4,086,003

ELECTROCHROMIC DISPLAY CELL

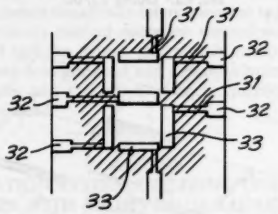
Akihiko Kouchi; Tsutomu Otake; Hiroshi Takeshita, all of Suwa, and Kunihiro Inoue, Okaya, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jul. 15, 1975, Ser. No. 596,135

Claims priority, application Japan, Jul. 15, 1974, 49-80934; Jul. 22, 1974, 49-83933

Int. Cl.[2] G02B *5/23;* **G02F** *1/01, 1/11, 1/17*

U.S. Cl. 350—357 **4 Claims**



1. The electrochromic display cell, comprising a first transparent wall, at least one transparent conductive electrode on the inner surface thereof, a second wall opposed to and spaced apart from said first wall, a reflective metal selected from the group consisting of gold and silver on the interior surface of said second wall, an electrochromic material in solution between said opposing inner surfaces, said electrochromic material in solution being the sole electrochromic material in said cell, at least one contact region proximate the edge of said first wall, a transparent conductive lead connecting said electrode on said first wall with said contact region, and an insulating layer over at least a portion of said transparent conductive lead, said reflective metal having an area including at least that area immediately opposite said conductive electrode on said first wall, said electrode on said first wall and said reflective metal being connectable to an exterior source of voltage and said reflective metal being selected to be inert when rendered negative at the voltage necessary for erasing a display generated by making said transparent electrode negative.

4,086,004

EYE GLASSES

Leonard Scrivo, Tuckahoe, N.Y., and Sidney Goldstein, Wynmoor, Pa., assignors to Vicon Products Corporation, Pelham Manor, N.Y.

Filed May 26, 1976, Ser. No. 689,967

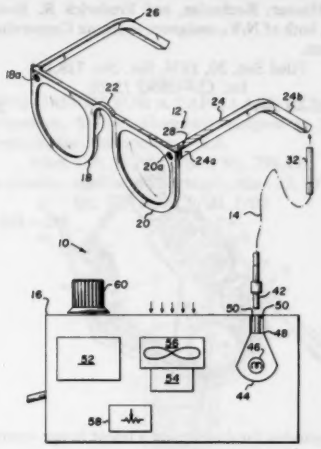
Int. Cl.[2] G02C *1/00, 5/14;* **G02B** *5/14*

U.S. Cl. 351—158 **19 Claims**

1. An improved viewing device comprising, in combination:

a spectacle frame including a pair of lens-holding members connected by a bridge member, and a pair of side-supporting arms, said side-supporting arms each including a first end connected to one of said lens-holding members and a second end including an ear-engagement portion;

means for transmitting light including a fiber-optic bundle disposed in at least one of said side-supporting arms, said fiber-optic bundle extending axially between said first and second ends and including a first optical face adjacent said first end of said side-supporting arm for projecting light within the viewing area between said spectacle frame and the object to be viewed, and a second optical face adjacent said second end of said side-supporting arm; and



means for connecting the second optical face of said fiber-optic bundle to a power supply for transmitting light through said fiber-optic bundle to said first optical face.

4,086,005

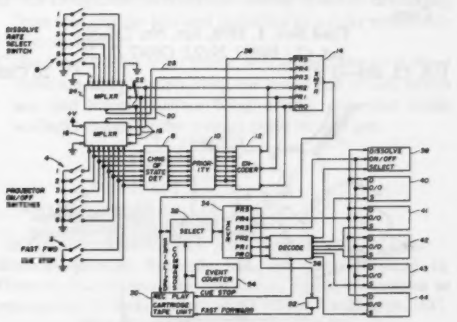
AUDIO-VISUAL PROGRAMMER

Erik N. Honebrink, Champlin, Minn., and Jon N. Myntti, Dayton, Ohio, assignors to Audio-Sine, Inc., Minneapolis, Minn.

Filed Oct. 26, 1976, Ser. No. 735,594

Int. Cl.[2] G03B *15/03*

U.S. Cl. 352—133 **11 Claims**



1. Apparatus for controlling the operation of plural photographic projectors comprising, in combination:

(a) manually operable switching means for selecting which of and how a plurality of projectors are to be activated;

(b) encoding means coupled to said switching means for developing multibit Program Command Words upon each operation of said switching means;

(c) a change of state detector connected intermediate said switching means and said encoding means for detecting a change in the status of said switching means; and

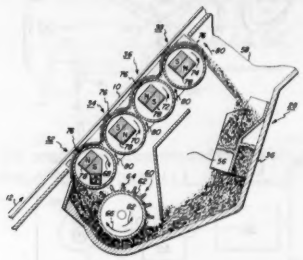
(d) decoding means responsive to said Program Control Words for applying control signals to selected ones of said plural projectors for causing said selected projectors to operate in a desired fashion.

4,086,006

PURGING SYSTEM FOR A DEVELOPMENT APPARATUS

Oscar G. Hauser, Rochester, and Frederick R. Ruckdeschel, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 30, 1976, Ser. No. 728,101
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—3 DD **23 Claims**



1. An apparatus for developing a latent image recorded on a member with developer particles, including:

a housing defining a chamber for storing a supply of developer particles therein;

means, disposed in the chamber of said housing and arranged to be in communication with the latent image recorded on the member, for depositing developer particles on the latent image; and

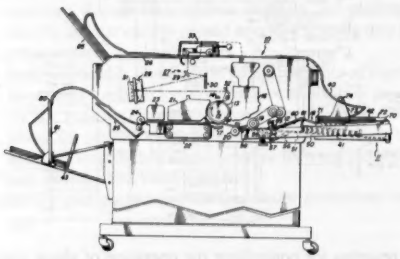
means for cleaning the developer particles from the chamber of said housing to permit developer particles of a different color to be disposed therein.

4,086,007

DUAL PURPOSE DOCUMENT AND COPY SHEET FEED CASSETTE

Craig A. Smith, Pittsford, and Clifford L. George, Macedon, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,302
Int. Cl.[2] B65H *29/22*; G03G *15/28*
U.S. Cl. 355—3 R **20 Claims**



9. In a reproducing apparatus including:

means for forming an image on a sheet of material, said image forming means including a photosensitive surface;

exposure means for viewing a document and for projecting an image thereof onto said photosensitive surface;

means for feeding said document to said exposure means; and

a cassette including a frame and means connected to said frame for supporting a supply of sheet material for feeding to said image forming means, said cassette and frame being arranged to be removable from said apparatus;

the improvement wherein said cassette further includes means connected to said frame for supporting said document for feeding to said exposure means;

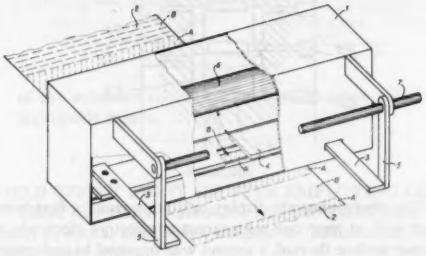
whereby removal of said cassette from said apparatus removes both said means for supporting said supply of sheet material for feeding to said imaging means and said means for supporting said document for feeding to said exposure means from said apparatus.

4,086,008

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH DEVICE FOR EXPOSING IMAGED PHOTOCONDUCTIVE PLATE

Leon M. W. Winthaegen, Maasbree, and Mathias J. J. M. Vola, Sittard, both of Netherlands, assignors to Océ-van der Grinten, N.V., Venlo, Netherlands

Filed Nov. 4, 1976, Ser. No. 738,906
Int. Cl.[2] G03G *15/00*
U.S. Cl. 355—7 **3 Claims**



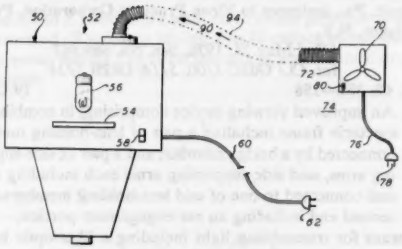
1. In an electrophotographic copying apparatus in which a photoconductive plate bearing a latent image is movable in a path to a station for developing the image and an exposure device comprising a light source and a movable light shield disposed over said path, said shield normally lying in a position to obstruct passage of light from said source to said plate and being displaceable away from said position for selectively exposing to such light areas of said plate outside the area of said image, the improvement wherein said light shield is made slightly light transmitting to effect a weak uniform exposure of the image area of said plate when said shield is in said position.

4,086,009

PHOTOGRAPHIC ENLARGING EQUIPMENT AND METHOD

William Gewirtz, New York, N.Y., assignor to Gerry Wind Assoc. Color Labs., New York, N.Y.

Filed Mar. 4, 1977, Ser. No. 774,449
Int. Cl.[2] G03B *27/52, 27/32*
U.S. Cl. 355—30 **4 Claims**



1. A photographic enlarger comprising:

(a) an enlarger head;

(b) illuminating means disposed within said enlarger head;

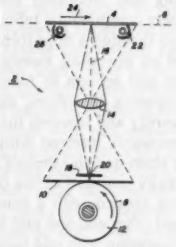
(c) enlarging component means supported by said enlarging head at least some of which are proximate said illuminating means;
(d) fan means for generating a flow of air into said enlarger head for cooling the interior of same and;
(e) means for supporting said fan means, wherein said means for supporting said fan means supports said fan means removed from said enlarger head;
(f) circuit means for providing suitable power to said illuminating means and said fan means to operate same; and
(g) control means associated with said fan means and enlarger head to reduce the effect of vibrations from said fan means upon said enlarger head, the elements housed therewithin and photographic items made thereby, wherein said control means include flexible hose means for interconnecting said fan means to said enlarger head and wherein said control means includes selectively operable switch means electrically interconnected to said fan means to selectively control operation thereof and operable to shut off said fan means, said switch means being spaced from said enlarger head and thereby eliminate vibrations therefrom and the effect of such vibrations upon said enlarger head.

4,086,010

ILLUMINATION SYSTEM UTILIZING TWO OPPOSING DC LAMPS WITH AN OPTIMUM BARREL-SHAPED SLIT

Charles F. Gallo, Jr.; Thomas J. Hammond, both of Penfield, and James D. Rees, Pittsford, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 1, 1976, Ser. No. 737,299
Int. Cl.[2] G03B *27/54*
U.S. Cl. 355—70 **6 Claims**



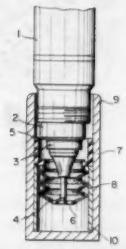
1. An optical system for projecting an image from an object plane to an image plane, including the following disposed along an optical axis:
a. an object platen to support an object in said object plane,
b. a projection lens,
c. a photoreceptor disposed in said image plane, and
d. an illumination system to illuminate said object platen including:
1. a first linear lamp disposed adjacent to and parallel to said object platen, said first lamp being a DC gas discharge lamp having an anode at one end and a cathode at the other end thereof and having an asymmetrical distribution pattern of output light intensity along its length,
2. a second linear lamp similar to the first and disposed parallel to said first lamp, with the anode and cathode of said second lamp disposed at the ends thereof in the reverse polarity with respect to said first lamp, the asymmetrical distribution patterns of light output intensity of said first and second lamps combining in a resultant symmetrical distribution pattern of output light intensity to illuminate said object platen with non-uniform, symmetrical light intensity along the dimension of said platen corresponding to the length of said lamps to compensate for off-axis light attenuation at said image plane.

4,086,011

SEALING GASKET FOR A CAPILLARY PEN COVER

Lasse Kuparinen, Sulfeld, Germany, assignor to Koh-I-Noor Rapidograph, Inc., Bloomsbury, N.J.

Filed Feb. 22, 1977, Ser. No. 770,491
Claims priority, application Germany, Mar. 22, 1976, 2612072
Int. Cl.[2] B43K *9/00, 1/00*
U.S. Cl. 401—258 **6 Claims**



1. In a covering cap for the point of a capillary writing pen of the type having a sleeve supporting an ink reservoir in communication with an axially extending tubular writing point, a gasket comprising:
A. A cup-shaped inner sleeve, supportable against the inner wall of the covering cap and conformed complementally with the writing pen sleeve so as to define:
i. a cylindrical guide
ii. an upper edge shoulder engagable with the pen sleeve, and
iii. a lower, radially inwardly extending annular seal, and
B. An elongatable bellows-like sealing chamber depending from said annular seal and including an axially extendable bottom surface;
C. Said cup-shaped inner sleeve, as a writing pen tip is fitted therein, sealingly supporting the lower end of said sleeve and said bottom surface being axially, distended while sealingly engaging the writing point of said pen.

4,086,012

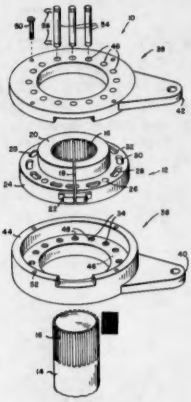
ROTATIONAL ENERGY ABSORBING COUPLING

William H. Buckley, Rockville, Md., and Garnett Ryland, II, Warsaw, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 20, 1976, Ser. No. 724,807
Int. Cl.[2] B63B *1/28*
U.S. Cl. 403—2 **5 Claims**

1. A rotational energy absorbing coupling for shaft-to-crank arm applications comprising:
first disc means affixed to a shaft, the first disc means comprising an inner disc which has a collar portion adapted to be secured against rotation relative to the shaft, a flange portion formed radially outwardly from said collar portion, and a uniaxial circular pattern of holes in said flange portion;
second disc means adjacent said first disc means and connected to a rotation means, said second disc means comprising a pair of outer discs, one on either side of said flange portion of said inner disc so as to envelope said inner disc and a uniaxial circular pattern of holes in said

pair of outer discs and in register with said uniaxial circular pattern of holes in said flange portion of said inner disc;



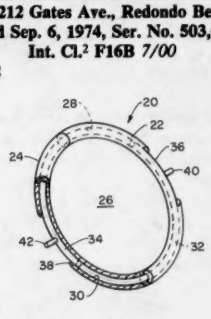
a plurality of yieldable means connecting said first and second disc means, said yieldable means being adapted to sequentially bend and then shear to absorb an impact load.

4,086,013

COUPLING MECHANISM

Elgin J. Miller, 2212 Gates Ave., Redondo Beach, Calif. 90278

Filed Sep. 6, 1974, Ser. No. 503,609
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—292 **4 Claims**



1. A basic mechanism comprising:

a first member having a first internal chamber of constant cross-sectional area, said first internal chamber being arcuate along its length;

a second member having a second internal chamber of constant cross-sectional area, said second internal chamber being arcuate along its length, said first member and said second member connectable together with their ends in abutting contact with said first and said second chambers forming a continuous chamber, said first chamber being substantially the same size in cross-section as said second chamber with said first and said second members connected together there being an aperture entirely through the basic mechanism connecting with the ambient at each end;

a third member contained within said first chamber establishing a close fit with the interior of said first chamber, said third member movable within said second chamber to occupy both a portion of said second chamber and a portion of said first chamber, said third member being no greater in length than the length of said first chamber;

means for moving said third member within said continuous tubular chamber, said means permitting selecting of a first position of said third member solely within the confines of said first chamber or a second position occupying a portion of both said first chamber and said second chamber;

a fourth member contained within said second chamber, said fourth member movable within said first chamber to occupy both a portion of said first chamber and a portion of said second chamber, said fourth member being no greater in length than the length of said second chamber, said fourth member establishing a substantially close fit with said first and second chambers;

said third member being equal in length to said fourth member; and

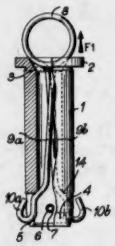
the length of said third member being substantially equal to the length of said first chamber, the length of said fourth member being substantially equal to the length of said second chamber.

4,086,014

QUICK LOCKING AND UNLOCKING CONNECTOR

Jean-Pierre Jalaguier, Marignane, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed May 24, 1976, Ser. No. 689,050
Int. Cl.[2] B25G 3/00
U.S. Cl. 403—317 **8 Claims**



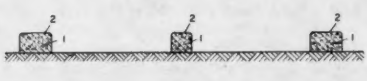
1. Quick locking and unlocking connector for joining a plurality of members comprising a tubular body adapted to be removably inserted through a bore formed in the members to be connected and an operating member comprising a metal wire looped at its mid section to form a pull ring and two elongated legs extending therefrom, each leg ending with a hook curved upwardly and towards the inside, said operating member being removably inserted with said tubular body so that said pull ring abuts one end thereof and the hooks extending resiliently radially outward of the other end thereof, said tubular body being formed with a frustoconical ramp on its inner surface at said other end and said legs being formed with a bent portion cooperating with said ramp to partly retract said hooks towards the inside of said tubular body on removal of said member, said hooks being further formed with a rounded portion on its radial exterior followed by straight inwardly directed portion cooperating with the bore of the parts being assembled to completely retract said hooks towards the inside of said tubular body on movement of the tubular body through said bore.

4,086,015

CRASH MODERATION SYSTEM FOR ROADS, HIGHWAYS, RAILWAYS, AIRFIELDS AND HARBORS

Sonja Margareta Isabella Eliasson, Roskildevagen 17 A, S-217 46 Malmo, Sweden

Filed Sep. 27, 1976, Ser. No. 727,163
Int. Cl.[2] E01F 13/00
U.S. Cl. 404—6 **10 Claims**



1. A crash moderation system for placement on a supporting surface and comprising a barrier which includes:

(a) strong, kinetic-energy-absorbing, lightweight, pellet-

form material with a maximum density of approximately 40 pounds per cubic foot and pellets ranging from 0 to 1.25 inches in diameter, and

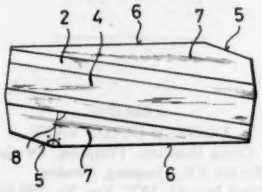
(b) material-surrounding binding means to contain the pellets, to sustain their kinetic-energy absorbing effect and to provide the barrier with a surface that makes an angle with the supporting surface which is steeper than the angle of repose for the lightweight material.

4,086,016

CUTTING TOOL

Alfons Goeke, Solingen, Germany, assignor to Th. Kieserling & Albrecht, Solingen, Germany

Filed Nov. 12, 1975, Ser. No. 631,413
Claims priority, application Spain, Nov. 13, 1974, 207.422
Int. Cl.² B26D *1/00*
U.S. Cl. 407—114 **1 Claim**



1. A cutting tool having a cutting edge defined by main and secondary cutting edges intersecting one another at an included obtuse angle, said secondary cutting edge being substantially longer than said main cutting edge, a chip deflecting step extending along said cutting edge substantially perpendicular to a line bisecting said angle, with each of the two cutting edges having an angular relationship to said chip deflecting step converging and diverging in opposite directions; said tool comprising an insert having said cutting edge thereon and a carrier member for said insert, said carrier member having opposite ends, opposite side edges and opposite faces, a pair of said inserts attached to one of said faces in reversely positioned relationship to one another with said secondary cutting edges on said pair of inserts extending generally parallel to one another and said main cutting edges extending from said secondary edges to said opposite ends; said tool having a longitudinal axis of elongation and said carrier member having a web located between said inserts, said web having a web axis of elongation intersecting said longitudinal axis whereby said web extends generally diagonally across said carrier member, parallel to the chip deflecting step and perpendicular to said bisecting line.

4,086,017

DEVICE FOR LOCATING PIANO HAMMERS FOR DRILLING

Charles A. Nessler, deceased, late of Carnegie, Pa., and by Mary M. Mulhern, executrix, 221 Greenway Rd., Ridgewood, N.J. 07450

Filed May 2, 1977, Ser. No. 793,040
Int. Cl.² B23B *47/28*
U.S. Cl. 408—89 **6 Claims**

1. A device for positioning piano hammers for drilling an opening to receive a supporting stem which extends through the longitudinal axis of the piano hammer and at a preselected angle relative to a plane normal to the longitudinal axis, said device comprising:

(a) a support assembly including;

(i) a horizontal base;

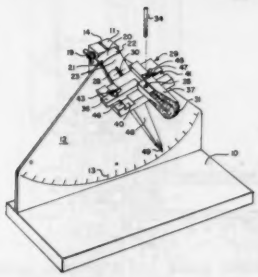
(ii) a supporting column extending upwardly from said base; and

(iii) a vertically disposed plate member extending from said base in contiguous relation with said supporting column;

(b) a selectively rotatable shaft journaled in said supporting column and extending from the latter in a plane parallel with and spaced from said base;

(c) supporting means fixed on said rotatable shaft and supporting a platen support shelf on which a piano hammer is positioned for drilling;

(d) said supporting means including;



(i) means for selectively raising and lowering said platen support shelf thereon for locating the longitudinal axis of a hammer to be drilled co-axial with the axis of said rotatable shaft; and

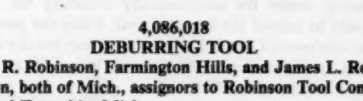
(ii) means for rotating said rotatable shaft to pivot said platen support shelf to a predetermined position while maintaining the longitudinal axis of the hammer co-axial with said shaft to effect drilling an opening through the hammer at an angle.

4,086,018

DEBURRING TOOL

William R. Robinson, Farmington Hills, and James L. Roberts, Clinton, both of Mich., assignors to Robinson Tool Company, Redford Township, Mich.

Filed Apr. 7, 1977, Ser. No. 785,489
Int. Cl.² B23B *51/16*
U.S. Cl. 408—226 **4 Claims**



1. A deburring tool comprising: an elongated arbor formed with a cutting blade recess; a unitary cutting tool having a cutting head with an elongated, flat, resilient blade extending therefrom and received in said recess; and mounting means securing the end of said blade opposite said cutting head to said arbor in non-pivotal relationship with respect to said arbor with said cutting blade projecting from said recess and the portion of said blade extending from said mounting means being yieldable to permit said cutting head to move inwardly with respect to said recess, said mounting means comprising a pair of axially spaced pins mounted in said body and extending transversely through said recess and said blade.

4,086,019

TRANSMISSION MEANS FOR CENTRIFUGAL COMPRESSORS

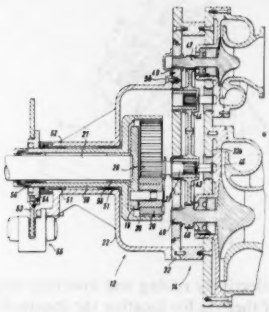
Eric John Poole, Wendover, England, assignor to Compair Industrial Limited, England

Continuation-in-part of Ser. No. 543,182, Jan. 22, 1975, abandoned. This application May 21, 1976, Ser. No. 688,561

Claims priority, application United Kingdom, Jan. 31, 1974, 4604/74

Int. Cl.[2] F01B *25/02;* **F01D** *17/08, 15/12;* **F16H** *37/06*

U.S. Cl. 415—18 **9 Claims**



1. A centrifugal compressor comprising at least one stage with its own impeller shaft, a bearing for said shaft;

an inlet for gas to be compressed;

an outlet for compressed gas;

an epicyclic gear train for driving the impeller shaft which epicyclic gear train comprises three members, a sun gear, a ring gear and a carrier on which a series of planet gears are mounted in mesh with the sun and ring gears, means to connect power input means to one of the members of the epicyclic gear train and means connecting a second of the members to the impeller shaft, said last means comprising a step-up gear train composed of at least two parallel shaft gears;

means for braking the rotational speed of the third of said members to control the speed of the impeller shaft; and,

actuating means for automatically releasing the braking means to unload the impeller shaft when the pressure of the compressed gas falls whereby to prevent the impeller shaft from running in the bearing in an unloaded high speed condition.

4,086,020

HYDRAULIC MACHINE

Seiichi Tanabe, and Syoji Ito, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

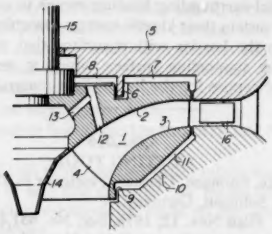
Continuation-in-part of Ser. No. 584,253, Jun. 6, 1975, abandoned. This application Jul. 7, 1976, Ser. No. 703,240

Claims priority, application Japan, Jun. 7, 1974, 49-64081

Int. Cl.[2] F04D *29/66*

U.S. Cl. 415—106 **10 Claims**

1. A hydraulic machine comprising: a runner having a crown ring, a shroud ring, a runner boss, and a plurality of blades interposed between said crown ring and said shroud ring, a runner crown chamber arranged between said crown ring and an upper cover disposed in spaced juxtaposed relation with the crown ring, a plurality of first balance hole means formed in said crown ring for communicating between said runner crown chamber and low pressure sections defined by said blades, and a plurality of second balance hole means formed in said crown ring for communicating between said runner crown chamber and the interior of said runner boss whereby said first and second balance holes means have reverse thrust characteristics with respect to each other so that a thrust of a substantially constant value is applied to said runner



regardless of a variation in the number of revolutions of said runner.

4,086,021

COOLED GUIDE VANE

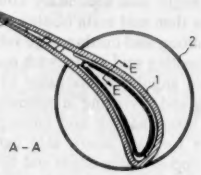
Svante Bengt Gosta Stenfors, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Jan. 19, 1977, Ser. No. 760,610

Claims priority, application Sweden, Jan. 19, 1976, 7600473

Int. Cl.[2] F01D *25/12*

U.S. Cl. 415—115 **12 Claims**



1. A cooled guide vane for a gas turbine, comprising:

a hollow blade body having a wall, a leading edge and a trailing edge;

means for introducing cooling air flow to the interior of said hollow blade body;

at least one perforation through said wall of said hollow blade body at said trailing edge for exhausting cooling air from the interior of said hollow blade body;

a plurality of grooves on the interior of said wall, said grooves extending essentially parallel with the direction of gas flow over the outside of said hollow blade body;

imperforate plate means, located in the interior of said hollow blade body, and shaped to cover at least a portion of said plurality of grooves, for preventing air flow directly from said means for introducing cooling air to said at least one perforation through said wall, said imperforate plate being open toward said leading edge; and

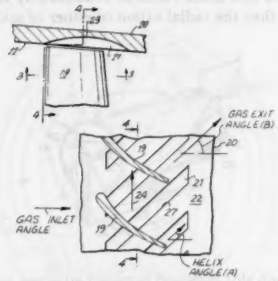
perforated plate means, located in the interior of said hollow blade body and positioned at least partially within and partially overlapped with said imperforate plate means, said perforated plate means having at least one perforation for passing cooling air to said leading edge of said hollow guide vane,

whereby cooling air from said means for introducing cooling air flows through said at least one perforation in said perforated plate means, through said plurality of grooves and through said at least one perforation through said wall of said hollow blade body.

4,086,022
GAS TURBINE ENGINE WITH IMPROVED COMPRESSOR CASING FOR PERMITTING HIGHER AIR FLOW AND PRESSURE RATIOS BEFORE SURGE

Christopher Freeman, Farnsfield, and Robert Rudolph Moritz, Littleover, both of England, assignors to Rolls-Royce Limited, London, England

Filed Sep. 7, 1976, Ser. No. 720,656
Claims priority, application United Kingdom, Sep. 25, 1975, 39260/75
Int. Cl.[2] F01D *5/26, 25/04;* F04D *29/68*
U.S. Cl. 415—119 **2 Claims**



1. An axial flow compressor for a gas turbine engine comprising:

a rotor having at least one blade row with an axis of rotation;

a compressor casing having an internal cylindrical surface surrounding said at least one blade row, said compressor casing having at least one circumferential row of slots, each of said slots having side walls, a bottom wall and a helical angle of inclination to the axis of rotation of said at least one blade row, said slots being disposed within the internal cylindrical surface of said casing adjacent to said at least one blade row and said slots having an axial length substantially greater than that of said at least one blade row and terminating downstream of said at least one blade row, said helical angle of inclination of each of said slots to the axis of rotation of said at least one blade row being substantially the same angle as an exit angle of fluid leaving said at least one blade row, and said bottom wall of each of said slots having a concave shape which is of substantially aerodynamic form so that high pressure fluid entering each slot adjacent said blade row is ducted along said slot to a location downstream of said at least one blade row and directed back into a main stream of fluid passing through the compressor.

4,086,023
WINDMILL

Burton D. Morgan, Hudson, Ohio, assignor to Concept Development Institute, Inc., Kent, Ohio

Filed Oct. 8, 1975, Ser. No. 620,855
Int. Cl.[2] F03D *3/06*
U.S. Cl. 416—132 B **2 Claims**

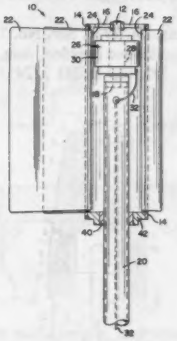
1. A windmill comprising

a support member,

a vertically positioned support shaft means operatively and rotatably positioned on said support member,

a plurality of elongated molded plastic vanes of arcuate shape and of uniform thickness in horizontal section operatively secured at one edge thereof to said support shaft means and extending outwardly therefrom, said vanes being equally spaced circumferentially about said shaft and being slightly flexible so winds engaging the concave surface of said vanes will urge said vanes to a flatter shape and will make the arc of other vanes tighter by engaging the convex surfaces of such other vanes to provide rotational forces on said vanes and provide an automatic feathering of the vanes, and

generator means positioned on said support member and operatively connected to said shaft means to provide power therefrom on rotation of said shaft means,

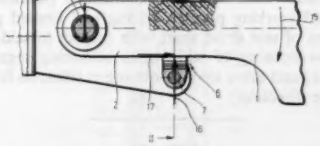


said vanes being semi-rigid and being deflected varied amounts by winds of different velocities whereby a variable feathering action is provided in said vanes, which have no moving parts, dependent upon the prevailing velocity, said vanes being more resistant to deflection by fluid forces engaging their concave surfaces than by fluid forces engaging their convex surfaces.

4,086,024
APPARATUS FOR CONNECTING A ROTOR BLADE TO A ROTOR HUB

Emil Weiland, Hohenbrunn; Alois Schwarz, Putzbrunn; Karl-Heinz Mautz, Ottobrunn, and Hubert Frommlet, Munich, all of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Germany

Filed Sep. 15, 1976, Ser. No. 723,440
Claims priority, application Germany, Sep. 20, 1975, 2541998
Int. Cl.[2] B64C *27/48*
U.S. Cl. 416—140 **12 Claims**



1. In a hingeless helicopter rotor structure having a hub, a plurality of pairs of arms rigidly connected to said hub and extending radially therefrom, a first bolt means journaled in each pair of arms and extending parallel to the axis of said hub, a plurality of rotor blades each having a neck rigidly affixed thereto, each bolt extending through a separate one of said necks for pivotally, positively mounting said rotor blades to said hub, second bolt means extending between each pair of arms further radially outwardly from the axis of said hub than said first bolt means, damping means comprising a first and second spaced apart metal plate with at least one elastomeric element sandwiched therebetween, and means mounting said damping means to damp relative movement of said rotor neck with respect to said second bolt means in response to rotation of said neck about the axis of said first bolt means, whereby said first and second bolt means and damping means cooperate

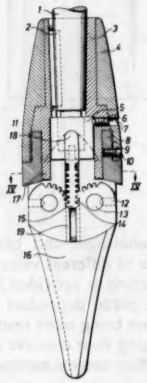
to transmit forces between said rotor blade and rotor hub in a damped manner.

4,086,025

PROPELLERS WITH RETRACTABLE BLADES

Sven Ingvar Åstrand, Barrstigen 14, S-151 50 Sodertalje, Sweden

Filed Aug. 13, 1976, Ser. No. 714,128
Claims priority, application Sweden, Aug. 22, 1975, 7509357
Int. Cl.[2] B63H *1/24*
U.S. Cl. 416—142 **4 Claims**



1. A propeller driven by a propeller drive shaft rotatable in either a forward or reverse direction comprising

a hub mounted for rotation with respect to said drive shaft for a limited period after the initiation of rotation of said drive shaft;

retractable blades disposed on said hub, each said blade being pivotably mounted on said hub and pivotable between an outward working position and an inward inactive position, each said blade including a gear segment portion;

a rack extending between said blades and coacting with the gear segments thereof, said rack being mounted for axial movement;

converter means for converting rotation of said propeller drive shaft in either its forward or reverse direction to an axial movement of said rack to thereby positively open said blades from said inward inactive position to said outward working position during said limited period of rotation of said drive shaft with respect to said hub, the positive opening of said blades occurring regardless of whether said drive shaft is rotating in either its forward or reverse direction.

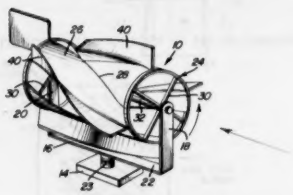
4,086,026

WINDMILL WITH RADIAL VANES

Robert J. Tamanini, 4 Pinewood Rd., Wyomissing, Pa. 19610

Filed Feb. 4, 1977, Ser. No. 766,055
Int. Cl.[2] F03D *1/06*
U.S. Cl. 416—176 **2 Claims**

1. A wind rotor comprising an elongated cylindrical body of a greater length than its diameter, having a cylindrical side wall and open at its opposite ends and journaled for rotation about an axis generally coinciding with the center axis of said body, said body including a plurality of circumferentially spaced longitudinally extending slots similarly slightly inclined relative to radial planes of said body passing through said slots, one set of corresponding edge portions of said cylindrical side wall defining corresponding longitudinal edges of said slots including integral outwardly projecting substantially rectangular outer vanes extending along said slots, said vanes comprising outwardly deflected integral portions of said cylindrical side wall, said vanes being disposed generally normal to lines tangent to said body at the base edges of said vanes integral with said body, the other set of corresponding edges of said cylindrical side wall defining the corresponding longitudinal edges of said slots including integral inwardly projecting substantially rectangular inner vanes extending along said slots, said inner vanes also being disposed generally normal to lines tangent to said body at the base edges of said inner vanes, the circumferential extent of each of said cylindrical side wall portions between corresponding outer and inner vanes comprising a narrow side wall band defining an offset between adjacent outer and inner vanes of considerably less circumferential extent than the radial extent of either of said corresponding vanes, each slot disposed between adjacent outer and inner vanes being of a width substantially equal to the combined radial extent of last mentioned vanes, said rotor including front and rear ends adapted to face into and opposite to the wind, a base from which said body is journaled, said base including support means for mounting said base for oscillation about an axis substantially normal to the first mentioned axis and disposed forwardly of the rear end of said rotor, said base including a wind vane generally paralleling said axes and disposed rearward of said support means, said outer vanes supported by said bands each leading the corresponding inner vane in the direction of rotation of said rotor as a result of wind incident thereon from the front end of said rotor.

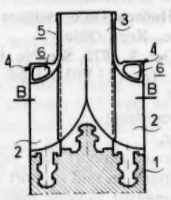


4,086,027

SHROUDED ROTOR BLADE ANNULUS FOR A CENTRIPETAL TURBINE STAGE

Wladyslaw Gundlach, Lodz; Jerzy Porochnicki, Czestochowa; Jerzy Prywer, Lodz; Boguslaw Karewicz, Lodz; Andrzej Potapczyk, Lodz, and Krzysztof Zielenow, Lodz, all of Poland, assignors to Politechnika Lodzka, Lodz and Zaklady Mechaniczne im. Gen. Karola Swierczewskiego "Zamech", Elblag, both of, Poland

Filed Apr. 4, 1975, Ser. No. 564,991
Claims priority, application Poland, Apr. 12, 1974, 170332
Int. Cl.[2] F01D *3/02*
U.S. Cl. 416—184 **2 Claims**



1. A shrouded rotor blade annulus structure for a centripetal double flow turbine stage, which comprises:

one row of radial blades;

two rows of axial blades disposed on opposite sides of the row of radial blocks; and

two segmental annular shrouds each covering the top of one

row of the axial blades and one side of the row of radial blades,

wherein the axial blades are integral with shroud segments comprising the two annular shrouds.

4,086,028

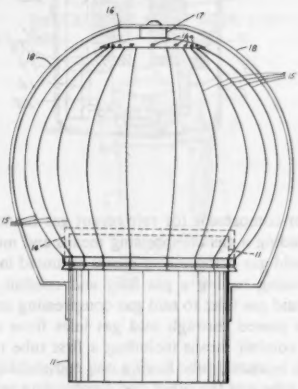
TURBINE VENTILATORS AND METHOD OF MANUFACTURE

John V. Felter, P.O. Box 7464, Houston, Tex. 77008

Filed Dec. 8, 1976, Ser. No. 748,418

Int. Cl.[2] F03D *3/06*

U.S. Cl. 416—227 A **3 Claims**



1. Rotary turbine ventilator, comprising a plurality of vertically disposed circularly spaced outwardly bowed vanes, an upper crown, a lower base ring, the upper ends of said vanes being connected equally spaced around the edge of said crown, the lower ends of said vanes being connected side by side around said base ring, bearing means supported above said crown and said crown being engaged therewith for rotation about a vertical axis, said vanes and said base ring being rotatable about said vertical axis with said crown, a cylindrical connection sleeve extending downward from within said base ring, said base ring being disposed concentrically spaced around said cylindrical connection sleeve, said lower ends of said vanes being arcuately formed and being disposed side by side in mutual engagements one with another and each against a lower edge portion of said base ring and said lower ends of said vanes and said lower edge portion of said base ring being bent inwardly and then conically divergent downwardly and the lowermost edge portion of said base ring being bent upwardly and inwardly against said downwardly divergent portions of said vane ends and firmly crimped thereagainst, whereby said vane ends are securely fixed to said base ring.

4,086,029

METHOD AND APPARATUS FOR FLUSHING THE PLUNGER OF A POSITIVE DISPLACEMENT PUMP

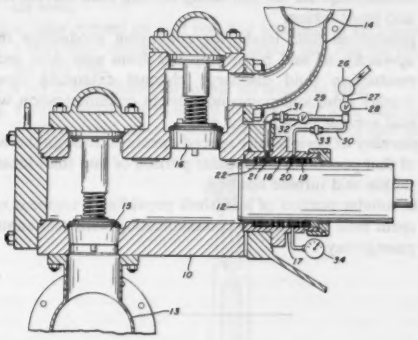
Robert M. Crane, Dallas, and Fletcher H. Redwine, Garland, both of Tex., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Dec. 6, 1976, Ser. No. 747,569

Int. Cl.[2] F01B *31/00*; F04B *39/00*

U.S. Cl. 417—53 **9 Claims**

1. In a pumping operation in which a suspension of particles is handled in a positive displacement pump, the plunger of which passes through sets of front and back packing rings as it reciprocates through suction and discharge strokes, an improved method of flushing particles from said plunger, said method comprising introducing a relatively large volume of flush liquid to said plunger at a location in front of said front set of packing rings, introducing a smaller volume of flush liquid at a location between said front and back sets of packing rings, initially maintaining the liquid introduced at the two locations at approximately the same pressure while maintaining the side of said back set of packing rings remote from said front set at a lower pressure, thus relying on said back set of packing rings



to provide a seal for said plunger, and when the packing rings of said back set wear and commence to leak, creating a differential in the pressure of the flush liquid introduced at the two locations and relying on said front set of packing rings to provide a seal.

4,086,030

FREE FLUID-OPERATED WELL TURBOPUMP

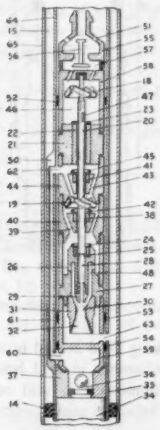
Ed B. David, Benton, Ark., assignor to EMC Energies, Inc., Mills, Wyo.

Division of Ser. No. 548,860, Feb. 10, 1975, Pat. No. 4,003,678.

This application Oct. 15, 1976, Ser. No. 732,672

Int. Cl.[2] F04B *23/04*

U.S. Cl. 417—88 **8 Claims**



1. In a fluid operated pumping system for use with an oil well having an outer tubular casing set in the well and an inner tubing within the casing radially spaced therefrom to define an annular passageway therebetween, a turbopump movable through said tubing from ground surface to an operating position at the lower end of said tubing, said turbopump comprising:

an upper driving turbine having a housing and an impeller therein, a lower driven pump having a pump impeller, and an axially disposed drive shaft connecting said impellers, said drive shaft having a solid end portion passing upwardly through said turbine impeller and an open end tubular

portion passing from within said turbine housing downwardly through said pump impeller,

a production fluid inlet at the lower end of said pump,

driving fluid intake openings in said housing above said turbine impeller for delivering driving fluid thereto from said inner tubing,

a production fluid intake for conveying production fluid upwardly to said pump impeller from said inlet and a production fluid discharge channel extending downwardly from said pump impeller in communication with said annular passageway, and

a plurality of peripherally spaced openings through the wall of that portion of the tubular portion of said shaft located within said turbine housing,

said tubular portion of said shaft providing a segment of a spent fluid passageway communicating with said annular passageway.

4,086,031

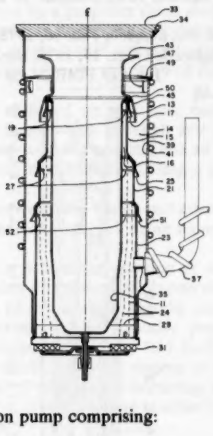
VAPOR DIFFUSION PUMP

Ned R. Kuypers, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 599,276, Jul. 25, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 747,744

Int. Cl.[2] F04C *19/00*

U.S. Cl. 417—154 **23 Claims**



1. A vapor diffusion pump comprising:

a housing;

a reservoir of working fluid in said housing;

means forming a chamber in said housing, said chamber being partially immersed in said reservoir to provide thermal contact between said chamber and said working fluid;

a working vapor region substantially concentric with, surrounding, and in thermal communication with said chamber;

at least one vapor pumping region substantially concentric with and surrounding said working vapor region and separated from said working vapor region by at least one nozzle;

heating means for vaporizing working fluid from said reservoir to generate working vapor in said working vapor region; and

condensation means for condensing said working vapor, said condensation means including means for returning said working fluid to said reservoir.

4,086,032

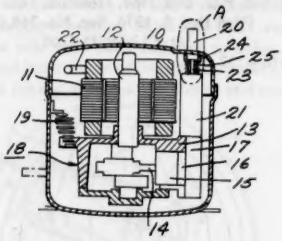
SEALED TYPE MOTOR-COMPRESSOR

Kazumitsu Nishioka, Inazawa, and Hiroshi Machida, Nagoya, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,797

Int. Cl.[2] F04B *17/00;* **F25B** *39/04;* **F04B** *35/00*

U.S. Cl. 417—363 **3 Claims**



1. A motor-compressor for refrigerant gas having a sealed housing including a gas compressing means and motor means for driving said gas compressing means mounted in said housing, said housing having a gas inlet and conduit means for connecting said gas inlet to said gas compressing means while isolating gas passed through said gas inlet from said motor means, said conduit means including a first tube mounted in said housing, a second tube having one end slidably mounted on said first tube and the other end surrounding said gas inlet and spring means disposed to constantly urge said second tube toward said gas inlet.

4,086,033

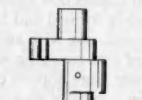
OIL PUMP FOR MOTOR COMPRESSOR

Alfred Stephan, Columbus, Ohio, assignor to White-Westinghouse Corporation, Pittsburgh, Pa.

Filed May 17, 1976, Ser. No. 686,889

Int. Cl.[2] F04B *17/00, 35/04, 39/14*

U.S. Cl. 417—368 **6 Claims**



1. A motor compressor having a housing enclosing a stationary stator and a rotor connected to a vertically-oriented motor shaft having an oil passage therethrough; centrifugal pump means for pumping oil to said oil passage in said shaft; said rotor having integrally formed opposed end rings sandwiching the rotor laminations therebetween; and

wherein the lowermost end ring includes said centrifugal pump means integrally formed therewith, said pump means depending from and supported by said lower most end ring substantially coaxially with said motor shaft and defining a tube having an oil passageway leading from the

distal end of said tube disposed in an oil reservoir to said oil passage of said shaft.

4,086,034

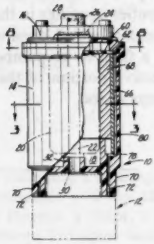
FLUID COOLED COMMUTATED ELECTRIC MOTOR DRIVING A PUMP

Stephen G. Hokky, North Olmsted, Ohio, assignor to Airborne Mfg. Co., Elyria, Ohio

Division of Ser. No. 552,174, Feb. 24, 1975, Pat. No. 3,982,146, which is a continuation-in-part of Ser. No. 341,539, Mar. 15, 1973, abandoned. This application Apr. 16, 1976, Ser. No. 677,775

Int. Cl.² F04B *35/04*; H02K *9/28*

U.S. Cl. 417—369 **5 Claims**



1. In an electric motor-pump combination, wherein the electric motor includes shaft means operating pump means from the end portion of said shaft means, and wherein said shaft means has a commutator on the opposite end portion which commutator cooperates with a pair of brushes, and wherein said motor includes a motor housing, the improvement comprising, a unitary molded cover structure formed of structural non-conducting bearing material, said cover material being molded to form a bearing structure for one end of said shaft and means to mount and guide said pair of brushes, said cover structure also including first and second sets of mounting means and reaction means, as least one of said means of each set being formed of low resistance current carrying material and extending externally of said cover structure, a pair of torsion springs each formed of a low resistance homogenous current carrying material, each torsion spring having first and second opposite end portions and a central coiled portion, the cetral coiled portion of each of the springs being wrappingly engaged around one of the mounting means, the first end portion of each of the springs engaging one of the reaction means, the second end portion of each of said springs engaging the end of one of the brushes opposite the end thereof engaging the commutator, each of said torsion springs acting as the sole current carrier to its respective brush, whereby a single spring acts both as a biasing element and sole current carrying element thereby providing brushes free of separate electrical connections, said cover structure being molded to form a fluid tight enclosure with said housing, and a closed channel structure defined at least in part by said motor housing extending from said pumping means and having openings terminating adjacent each of the brush means, whereby during the pumping operation a stream of pumped fluid is directed against the brush to cause a fluid flow at the brush-commutator interface.

4,086,035

BAILER PUMPS FOR OIL WELLS

Joseph Hart Klaeger, Jr.; Dale Edward Klaeger, and Robert Allen Klaeger, all of 1308 Shady La., Hondo, Tex. 78861

Filed Mar. 18, 1977, Ser. No. 779,180

Int. Cl.² F04B *17/00*

U.S. Cl. 417—410 **10 Claims**

1. A stripper bailer for oil wells comprising:

a. an elongated stan pipe having a top end and a well head end adapted to be secured to a well head,

b. a bailer mounted on said stan pipe,

c. a powered reel for propelling said bailer into and out of an oil well,

d. a cable wound on said reel and attached to said bailer,

e. a reversible motor operable engaging said reel for powering said reel,

f. a pivot arm tiltably mounted on said stan pipe,

g. a pulley rotatably mounted on said pivot arm, said pulley receiving said cable intermediate said reel and said bailer,

h. a first switch in association with said pivot arm for stopping and reversing said motor; and first switch operating responsive to the tilting of said pivot arm,

i. a first time delay means in operable association with said first switch causing a predetermined time delay when said motor is stopped,

j. dumping means for emptying said bailer at a well head, and

k. a wiring harness means interconnecting the electrical components.

4,086,036

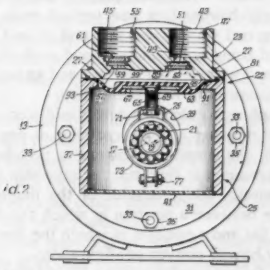
DIAPHRAGM PUMP

Loren M. Hagen, Chicago, and Ashwin H. Desai, Arlington Heights, both of Ill., assignors to Cole-Parmer Instrument Company, Chicago, Ill.

Filed May 17, 1976, Ser. No. 686,659

Int. Cl.² F04B *43/04*

U.S. Cl. 417—413 **13 Claims**



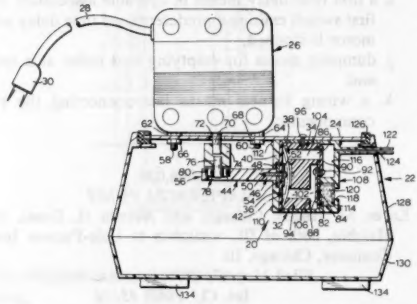
1. A fluid pump comprising a housing having an inlet for fluid, an outlet for fluid and a pumping chamber in communica-

tion with said inlet and outlet, inlet valve means, outlet valve means, a flexible diaphragm having an arcuate ridge formed therein, which diaphragm is clamped about its periphery between two separable sections of said housing and has one surface defining part of the boundary of said pumping chamber, said arcuate ridge being convex with respect to said pumping chamber, a connector extending from the central portion of the opposite surface of said diaphragm, means for attaching said housing to a rotary motor, and drive means for reciprocating said diaphragm to alternately draw fluid into the pumping chamber through said inlet valve means and then discharge the fluid through said outlet valve means, said drive means including an eccentric coupling for connection to the output shaft of the rotary motor plus linkage means joining said eccentric in driving relationship to said connector so that rotation of the motor shaft causes said diaphragm to be driven in a rocking, reciprocating movement, and one said housing section being formed with a curved surface portion which is a section of an annulus located on the pumping chamber side of said diaphragm and which has a radius of curvature such as to support said diaphragm during the period it is distended into the pumping chamber region and said other housing section being formed with a second curved surface portion which is a section of an annulus having a diameter substantially greater than the diameter of said first-mentioned annulus so that the regions of wear resulting from contact between each surface of said diaphragm and the respective supporting curved surface portions of said housing are radially spaced from each other.

4,086,037
DIAPHRAGM PUMP

John M. Stewart, Thornhill, Canada, assignor to Sanitation Equipment Limited, Downsview, Canada

Filed Oct. 4, 1976, Ser. No. 729,061
Claims priority, application Canada, Dec. 23, 1975, 242435
Int. Cl.[2] F04B *43/04, 39/10*
U.S. Cl. 417—571 3 Claims



1. A diaphragm pump comprising:

a housing of hollow cylindrical shape which defines a cylindrical cavity having first and second ends, and which includes an end wall at said first end of said cavity, said second end being open, and said end wall of the housing being formed with an inlet opening and an outlet opening, both communicating with said cavity;

a flexible diaphragm extending across said second end of the cavity and defining a pump chamber at one side of the diaphragm, the diaphragm having a peripheral portion which is arranged in fluid-tight relationship with respect to the housing, the remainder of the diaphragm being deflectable between a position in which the diaphragm is generally flat and a position in which the diaphragm is of outwardly bowed convex configuration;

drive means for repeatedly moving the diaphragm between said generally flat position and said outwardly bowed position;

first valve means associated with said inlet opening in the end wall of the housing for controlling entry of fluid to said pump chamber;

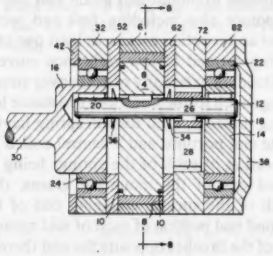
second valve means associated with said outlet opening in the end wall of the housing for controlling delivery of fluid from said chamber; and,

a generally cylindrical insert disposed in said pump chamber and dimensioned to fit closely in the said chamber between said end wall and said diaphragm, said insert defining, adjacent said diaphragm, a concave end face of a shape which is generally complementary to the shape of the diaphragm in said outwardly bowed configuration, and which defines with the diaphragm an effective portion of the pump chamber which closely corresponds in volume to the volume swept by the diaphragm in moving between its said positions, the insert being formed with two passageways which communicate respectively with said inlet and outlet openings in the end wall of the pump housing, and both of which open into said end face of the insert, so that a fluid to be pumped is conducted to and from said effective portion of the pump chamber along said passageways in use.

4,086,038
ROTARY PISTON MACHINE OF TROCHOIDAL CONSTRUCTION

Jürgen Hans Wilhelm Lambrecht, Max-Ruttgers Str. 29, Irschenhausen, Germany (8026)

Filed Jun. 12, 1975, Ser. No. 586,223
Claims priority, application Germany, Dec. 6, 1974, 242832; Mar. 5, 1975, 251990
Int. Cl.[2] F01C *1/02, 21/02*
U.S. Cl. 418—60 1 Claim



1. In a rotary piston machine of trochoidal construction having a piston mounted on an eccentric shaft in a housing delimited on both sides by side walls, said piston being rotated by a follower means, one part of which is rigidly connected with the piston,

the improvement comprising eccentric disc means which balances said machine,

two bearing means which are eccentric with respect to each other and one of which bearing means is radially within the other,

eccentrically-rotatable shaft means positioned in said eccentric disc means and one of said bearing means, said piston and the part of said follower means rigidly connected therewith being positioned in said housing by said eccentrically-rotatable shaft means, said eccentric disc means being rotatably supported in the other of said bearing means,

and means on said eccentric disc means whereby drive or power takeoff of said machine may be effected.

4,086,039

ORBITAL MACHINE WITH COOPERATING LOBE AND RECESS GUIDE MEANS

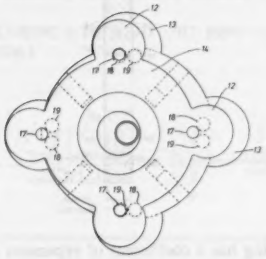
John P. Ettridge, 14 Somers St., North Brighton, South Australia, Australia (5048)

Filed Oct. 29, 1976, Ser. No. 737,041

Claims priority, application Australia, Nov. 4, 1975, PC3835; Dec. 22, 1975, PC4363

Int. Cl.[2] F01C *1/02, 19/04, 21/06, 21/12*

U.S. Cl. 418—61 R 3 Claims



1. A rotary machine including a housing, a chamber within the housing, a shaft concentric with the chamber and having eccentrically mounted thereon a rotor, a plurality of vanes dividing the space between the rotor and inner wall of the chamber into working chambers and valve means to control flow of fluid through said working chambers, the rotor being guided to partake of an orbital movement within the chamber by a plurality of cooperating lobes and recesses on the rotor and the housing whereby the rotor is prevented from rotation while partaking of its orbital movement characterized in that the lobes are formed on a plate attached at one end of the rotor, and the recesses are formed in a porting side plate forming a side wall of the chamber, a port in said lobe cooperating with ports in said porting side plate to form the valve means.

4,086,040

ROTARY COMPRESSOR COMPRISING IMPROVED ROTOR LUBRICATION SYSTEM

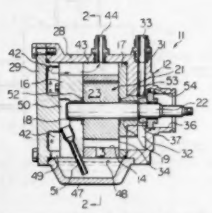
Tsunenori Shibuya, and Hiroshi Kondo, both of Konan, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 23, 1976, Ser. No. 716,621

Claims priority, application Japan, Aug. 26, 1975, 50-118077[U]

Int. Cl.[2] F01C *21/04;* F04C *29/02*

U.S. Cl. 418—76 6 Claims



1. A rotary compressor comprising, in combination:
- a housing having a cylinder formed with a bore and first and second end plates closing ends of the cylinder;
- a fluid inlet passageway leading from a fluid inlet port into the bore;
- an oil separation chamber being formed as an annular cavity in one of the end plates;
- a first fluid outlet passageway leading from the bore into the oil separation chamber;
- a second fluid outlet passageway leading from the oil separation chamber to a fluid outlet port, the first and second fluid outlet passageways being separated by a rib of the cylinder;
- a rotor operatively disposed in the bore in such a manner as to compressively displace working fluid from the fluid inlet passageway to the first fluid outlet passageway;
- an oil sump in communication with the oil separation chamber; and
- an oil passageway leading from the oil reservoir to the fluid inlet passageway and communicating with the rotor in such a manner that oil is caused to flow through the oil passageway for lubrication of the rotor when a working fluid pressure in the oil separation chamber is greater than a working fluid pressure in the fluid inlet passageway;
- the first and second fluid outlet passageways being formed as substantially parallel longitudinal passageways in the cylinder and opening perpendicularly into the oil separation chamber so that a working fluid flow path defined therethrough changes direction in the oil separation chamber to an extent great enough that oil entrained in working fluid flowing through the oil separation chamber is unable, due to an inertial force of the oil, to negotiate said change in direction, is separated from the working fluid and flows from the oil separation chamber into the oil reservoir.

4,086,041

ROTARY COMPRESSOR COMPRISING IMPROVED ROTOR LUBRICATION SYSTEM

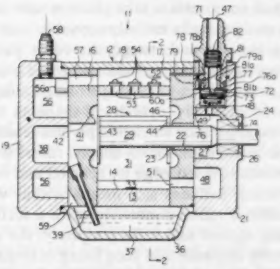
Haruhiko Takada, Konan, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1976, Ser. No. 711,337

Claims priority, application Japan, Aug. 5, 1975, 50-108888[U]

Int. Cl.[2] F01C *21/04, 21/12;* F04B *49/02;* F04C *29/02*

U.S. Cl. 418—84 9 Claims



1. A rotary compressor comprising:
- a housing formed with a bore;
- a fluid inlet passageway leading to the bore and being formed with a fluid inlet port;
- a fluid outlet passageway leading from the bore and being formed with a fluid outlet port;
- a rotor operatively disposed in the bore in such a manner as to compressively displace fluid from the inlet passageway to the outlet passageway;
- a lubricant reservoir in communicaton with the outlet passageway;
- a lubricant passageway leading from the lubricant reservoir to the inlet passageway and communicating with the rotor in such a manner that lubricant is caused to flow through the lubricant passageway for lubrication of the rotor when a pressure in the outlet passageway is greater than a pressure in the inlet passageway;
- a check valve provided to the inlet port and arranged to open the inlet port when the pressure in the inlet passageway is below a predetermined value and to block the inlet port when the pressure in the inlet passageway is above the predetermined value;

an equalizing passageway leading from the outlet passageway to the inlet passageway; and

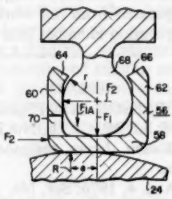
an equalizing valve provided in the equalizing passageway and connected for unitary operation with the check valve, the equalizing valve being arranged to block the equalizing passageway when the pressure in the inlet passageway is below the predetermined value and to open the equalizing passageway when the pressure in the inlet passageway is above the predetermined value.

4,086,042

ROTARY COMPRESSOR AND VANE ASSEMBLY THEREFOR

Robert R. Young, Franklin Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 17, 1976, Ser. No. 697,099
Int. Cl.[2] F01C *19/04, 1/00;* F04C *27/00*
U.S. Cl. 418—139 **6 Claims**



1. In a rotary compressor;

a hollow housing;

a rotor in the housing having a changing curvature periphery presented to the spaces in said housing in which suction and compression take place as said rotor turns;

at least one generally radially movable vane assembly separating the spaces between the rotor periphery and the housing into a compression space and a suction space;

said vane assembly comprising a blade having a longitudinal edge of generally cylindrical-shape in transverse cross section, and a shoe carried in pivotal relation on said edge, said shoe having a socket-shaped recess within which said cylindrical-shaped edge is received and retained;

said housing includes slot means within which said vane assembly is radially movable, with a surface of said shoe bearing against said rotor periphery, the end of said vane assembly opposite said shoe being in communication with high side pressure developed by said compressor so that the force developed by said high side pressure urges said bearing surface of said shoe against said rotor periphery; and

said shoe includes vent opening means only in the face thereof facing the compression space in said compressor to reduce the moment tending to tilt said shoe around said cylindrical-shaped edge.

4,086,043

ROTOR WITH PLASTIC SHEATHING

Frank D. Howe, Painted Post, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Dec. 30, 1976, Ser. No. 755,456
Int. Cl.[2] F01C *21/08;* F03C *3/00;* F04C *15/00;* B29C *27/00*
U.S. Cl. 418—152 **7 Claims**

1. A rotor, for use in a rotary, positive-displacement fluid machine, comprising:

a rotor blank having a hub, and at least one radial tooth extending from said hub;

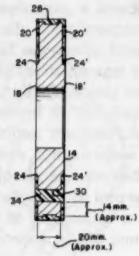
said hub having a given thickness;

said tooth having another thickness which is less than said given thickness;

said given and another thicknesses define in said blank, on opposite sides of said tooth, a pair of recessed lands; and

a sheathing of plastic, fixed on said lands, and therebetween in traverse of said blank, having surfaces which are substantially co-planar with surfaces of said hub; wherein

said blank is formed of a given material other than plastic having a prescribed coefficient of expansion;



said sheathing has a coefficient of expansion which is substantially equal to said prescribed coefficient of expansion;

said blank has a single, continuous groove formed in and fully along the outermost peripheral surface thereof;

said groove being of reentrant configuration, having a wider inner than outer dimension; and wherein

said sheathing further overlies said periphery, and is nestedly locked in said groove.

4,086,044

APPARATUS FOR THE MEASUREMENT OF THE WALL THICKNESS OF COATED ROD WITH CONSIDERATION OF ECCENTRICITY

Harald Sikora, Griesborner Strasse 37, 2800 Bremen, Germany

Filed Apr. 20, 1976, Ser. No. 678,620
Claims priority, application Germany, Apr. 22, 1975, 2517709
Int. Cl.[2] B29F *3/10*
U.S. Cl. 425—113 **9 Claims**

1. Apparatus for ascertaining the concentricity of the core of an elongated cable with respect to its coating comprising:

a measuring head through which such a cable may extend;

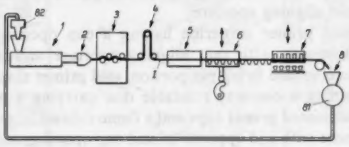
a position measuring device mounted on said head for ascertaining a predetermined axial position of the core of the coated cable with respect to said head; and

means mounted on said head for establishing a predetermined condition of the lateral dimension of the coated cable with respect to the head indicative of concentricity when the core is in said predetermined position and for sensing deviations in said lateral dimensional condition as an indication of core-coating eccentricity.

4,086,045
APPARATUS FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF THERMOPLASTIC MATERIAL

Alfons W. Thiel, Mainz, and Hans Hell, Wiesbaden, both of Germany, assignors to Bellaplast GmbH, Wiesbaden, Germany

Continuation-in-part of Ser. No. 408,083, Oct. 19, 1973, abandoned. This application Aug. 25, 1976, Ser. No. 717,750
Claims priority, application Germany, Oct. 25, 1972, 2252219; Dec. 19, 1972, 2262093; Jun. 4, 1973, 2328368; Sep. 6, 1973, 2344866
Int. Cl.[2] B29C *3/00;* B29D *7/02;* B29C *15/00*
U.S. Cl. 425—326.1 **28 Claims**

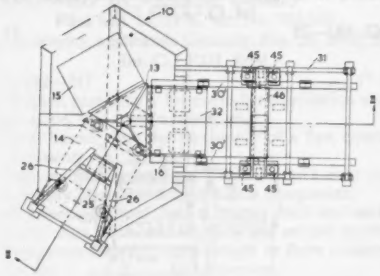


1. Apparatus for manufacturing thin-walled synthetic plastic articles which comprises extrusion means for forming a continuous hot plastic web of thermoplastic material at a predetermined high temperature, means for substantially immediately stabilizing said web to self supporting condition by cooling opposite surfaces of the web to provide therealong continuous outer supportive layers that are sufficiently deformable for shaping in subsequent shaping tool operation while the hot plastic material between said layers remains sufficiently plastic and fluid for redistribution between said layers during said tool operation, and means for advancing the stabilized web toward and into a thermal forming station in synchronism with shaping tools in said station adapted for forming articles in successive areas of said web during the period that said hot plastic material between the layers remains capable of redistribution between them.

4,086,046
WAX MOULD APPARATUS

John Anthony Brown, Otley, and Leslie Raymond Wilkie, Bradford, both of England, assignors to Numol Corporation, Gastonia, N.C.

Filed Oct. 24, 1975, Ser. No. 625,602
Int. Cl.[2] B29C *5/00*
U.S. Cl. 425—361 **11 Claims**

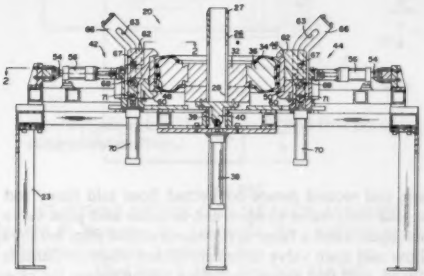


1. Apparatus for molding articles from paraffin wax while imparting to the wax articles a stratified molecular structure comprising means for supplying molten paraffin wax, mold means operatively communicating with said wax supplying means for receiving and shaping molten paraffin wax, turntable means for mounting said mold means for rotation successively to a wax receiving station and to a wax heat station and to a wax article transfer station, chilling means in heat exchange relation with said mold means at said wax receiving station for transfer of heat from said mold means and from molten wax received there within, and heating means in heat exchange relation with said mold means at said wax heating station for transfer of heat to chilled mold means and solidified wax there within.

4,086,047
TREAD RING DISASSEMBLY AND REASSEMBLY APPARATUS

John Arthur Johnsen, Copley, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 19, 1977, Ser. No. 798,412
Int. Cl.[2] B29H *5/08, 17/00, 3/08;* B29F *1/00*
U.S. Cl. 425—450.1 **4 Claims**



1. A tread ring disassembly and reassembly apparatus including in combination a frame, a vertically extending guide member mounted on said frame and having upper and lower end portions, a support member movable between upper and lower positions and being guided in said movement by said guide member, first motive power means operable connected to said support member for moving same between said upper and lower positions, first and second jaw assemblies mounted by said frame and being movable between open and closed positions, said first and second jaw assemblies in a first position being spaced from each other a distance on the order of the diameter of a tread ring to be disassembled and reassembled, said first and second jaw assemblies being mounted for back and forth movement in a horizontal direction between said first position and a second position where said first and second jaw assemblies are spaced a greater distance apart, second motive power means for moving said first and second jaw assemblies back and forth between said first and second positions, each of said first and second jaw assemblies having a lower jaw and an upper jaw, each said lower jaw being fixedly secured to its respective assembly, jaw guide means adjacent each of said upper jaws and cooperating with said upper jaws to guide same through vertical and lateral movement with respect to a corresponding lower jaw and between upper and lower positions, and third motive power means connected to said upper jaws for moving the same between their said upper and lower positions.

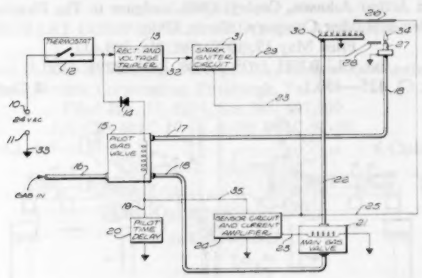
4,086,048
SPARK IGNITED RECYCLING IGNITION SYSTEM WITH INTERLOCKING GAS VALVE CONTROL

Elmer A. Carlson, Agoura, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 512,458, Oct. 7, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,110
Int. Cl.[2] F23Q *9/08*
U.S. Cl. 431—46 **2 Claims**

1. A gas heating system utilizing an intermittent pilot, said system comprising: a source of electrical power; a grounded pilot burner; a main burner adjacent said pilot burner to be ignited thereby; a spark ignitor having first and second input leads connected from said source; a start switch connected in

series with one of said spark ignitor input leads, said second input lead being grounded, said spark ignitor having an electrode adjacent said pilot burner, and first and second output leads connected to said electrode and in a manner to permit said spark ignitor to establish a spark between said electrode over said pilot burner; a pilot solenoid valve actuable to admit gas to said pilot burner; a main solenoid valve connected to receive gas and to pass said gas to said main burner; first means responsive to actuation of said start switch to open said pilot valve and to establish said spark; a flame rod over said pilot



burner; and second means connected from said flame rod to cause said main valve to open and to cause said pilot valve to remain open when a flame is produced at said pilot burner and to allow said main valve to remain closed when no flame is so produced, said first means including timing means for closing said pilot valve should a predetermined time elapse after actuation of said start switch without pilot flame ignition, said second means including a circuit to direct the same electrical current through said pilot and main valve solenoids when a pilot flame is produced, an open in either solenoid winding causing both of said valves to close.

4,086,049

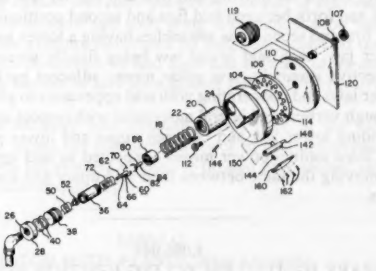
IGNITOR FOR STARTING FIRES

Bernard August Swanson, 11805 SE. 54th. Pl., Bellevue, Wash. 98006

Continuation-in-part of Ser. No. 651,606, Jan. 22, 1976, abandoned. This application Dec. 20, 1976, Ser. No. 752,558

Int. Cl.² F23Q *1/06*

U.S. Cl. 431—271 **6 Claims**



1. An igniter for starting fires comprising in combination:
a. a firing activating assembly;
b. a primer magazine assembly mounted next to said firing activating assembly;
c. a primer cap aligning assembly mounted next to said firing activating assembly and said primer magazine assembly;
d. said firing activating assembly comprising a housing containing a piston-cylinder adapted for displacement from an inactive position to a firing position through input of an associated fluid pressure into said housing;
e. said piston-cylinder containing an integrally mounted wall, with an opening in its center, dividing said piston-cylinder into a first and a second chamber;
f. said first chamber successively containing a slidably arranged hammer spring and a hammer means with a dead-ended opening facing toward said wall opening;
g. said second chamber provided with an aligning aperture and successively containing: a striker pin with a first portion having a diameter smaller than said wall opening and said hammer opening, a beveled expanding portion, a larger diameter second portion of a diameter smaller than said wall opening and a slanted mushroom-shaped head portion, respectively; a striker spring positioned between said wall and said mushroom head and a firing pin having a head portion abutting said mushroom head and a firing pin portion extending out of said piston-cylinder through said aligning aperture;
h. said primer magazine having a cap opening in direct alignment with said aligning aperture and adapted to receive said firing pin portion, said primer magazine containing a one-way rotatable disc carrying a plurality of associated primer caps and a flame exhaust nozzle in alignment with and opposite of said cap opening, and said rotatable disc having indent means near each of said primer caps; and
i. said primer aligning assembly containing a spring-loaded dog ratchet having a cam extending into said housing and a bias means extending in said magazine assembly in contact with said indent means, whereby upon displacement of said piston-cylinder into said firing position said cam is depressed and said dog ratchet moves said bias means for rotating said disc by said indent means so that an associated cap becomes aligned between said opening and said exhaust nozzle.

4,086,050

METHOD AND APPARATUS FOR GAS CIRCULATION IN A HEAT TREATING FURNACE

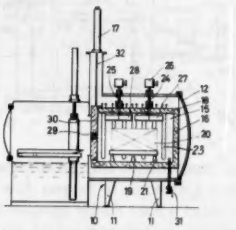
Cornelis Hendricus Luiten, and Ferdinand Limque, both of Nijmegen, Netherlands, assignors to Ipsen Industries International, Kleve, Germany

Filed Jan. 5, 1976, Ser. No. 646,502

Claims priority, application Germany, Jan. 15, 1975, 2501360

Int. Cl.² F27D *7/00*

U.S. Cl. 432—25 **11 Claims**

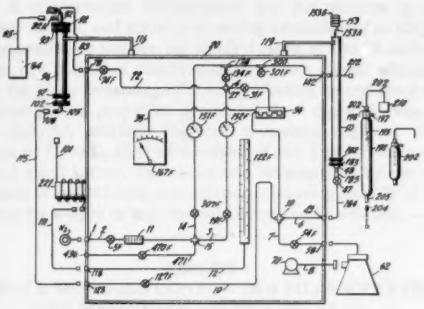


1. Method for thermo-chemical treatment of work pieces in a furnace operated at pressure, in particular vacuum, characterized by the steps of treating the charge, introducing the treating gas into the vacuum chamber containing the charge, causing the gas to become turbulent while avoiding a stable gas circulation, and varying the flow pattern and intensity of the gas circulation during the treatment of the charge.

4,086,051
SYSTEM FOR PREPARING PACKED COLUMNS AND COATED CAPILLARY TUBES USEFUL IN GAS CHROMATOGRAPHY

Srivas Rangachar Srinivas, 2850 Webb Ave., Apt. 5J, Bronx, N.Y. 10468

Continuation of Ser. No. 495,500, Aug. 7, 1974, abandoned. This application Apr. 29, 1976, Ser. No. 681,604
Int. Cl.[2] F27B *5/04*; B01D *15/08*
U.S. Cl. 432—198 **1 Claim**



1. A system useful for conditioning gas chromatographic columns and the like comprising in combination: oven means adapted for the removable fastening therein of a plurality of gas chromatographic columns to be conditioned, said oven means being adpated with suitable means for heating said columns to an elevated temperature, means for passing an inert gas through said columns while fastened within said oven means, means for varying gas flow rate through said columns associated with said means for passing inert gas, and means for measuring the back gas pressure, at a given gas flow rate, at the inlet of any one of said plurality of columns during conditioning thereof, said means for measuring the back gas pressure at a given gas flow rate comprising a gas flow meter in communication with the outlet of any one of said plurality of columns and a pressure measuring gauge in communication with the inlet of any one of said plurality of columns.

4,086,052
CERAMIC BURNER FOR COMBUSTION CHAMBER FOR HOT-BLAST STOVE

Walter Laux, Wiesbaden; Rudolf Hebel, Ginsheim/Gustavsburg, and Rolf Schneider, Nauheim, all of Germany, assignors to Didier-Werke AG, Wiesbaden, Germany

Filed Sep. 16, 1976, Ser. No. 723,936
Claims priority, application Germany, Sep. 20, 1975, 2541991
Int. Cl.[2] F23L *9/04*
U.S. Cl. 432—217 **17 Claims**

1. A burner, particularly for use in the combustion shaft of a hot-blast stove, said burner comprising:

a central burner duct for the supply of a first combustion component;

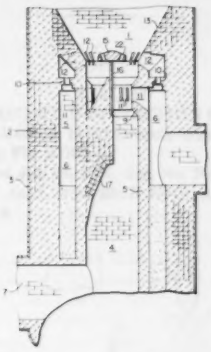
an outer annular duct, coaxial to said central burner duct, for the supply of a second combustion component;

means connecting said central burner duct and said outer annular duct for combining first and second combustion components flowing therethrough to form a component mixture;

a disk-shaped mixing element means, positioned centrally within said central burner duct at a position downstream in the direction of flow of said combustion components of said combining means, for retarding the flow of said component mixture in the downstream direction;

said mixing element means occupying a portion only of the cross-sectional area of said central burner duct, such that a first portion of said component mixture flows past said mixing element means around the periphery thereof; and

said mixing element means having extending therethrough, substantially in the direction of flow of said combustion components, a ring of separate passages such that a second portion of said component mixture flows through said

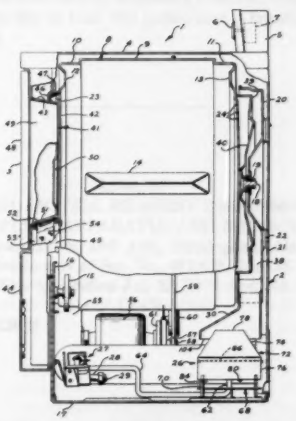


separate passages and mixes with said first portion of said component mixture.

4,086,053
CLOTHES DRYER GAS HEATER ASSEMBLY

Edward G. Sommer, Jr., Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 9, 1976, Ser. No. 721,760
Int. Cl.[2] F24H *1/00*; F26B *11/04*
U.S. Cl. 432—222 **10 Claims**



1. In a clothes dryer having a gas heater assembly for heating the air, the improvement comprising:

a. a gas control valve,

b. a gas nozzle in gas flow communication with the valve, said nozzle having an exit orifice,

c. a plate member spaced from the nozzle orifice, such that gas will impinge the plate member,

d. a combustion chamber having a truncated cone-shaped upper portion with downwardly diverging side walls, said chamber having an opening at the top and bottom thereof, said chamber surrounding and spaced outwardly of both the plate member and nozzle, said bottom opening arranged to allow air into the combustion chamber below the nozzle orifice for mixing with the gas exiting the nozzle orifice,

e. means to ignite the gas and air mixture after it impinges the plate member, and

f. a hood member over and spaced outwardly of the opening at the top of the combustion chamber to allow ambient air into the hood member for mixing with the heated air.

4,086,054

CONCENTRATED STORAGE-STABLE SOLUTIONS OF ALKYLBENZENESULFONATES OF BASIC DYES

Walter Seibert, Ludwigshafen; Guenther Riedel, Heidelberg-Wieblingen, and Kurt Mayer, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 482,136, Jun. 24, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,455
Claims priority, application Germany, Jun. 27, 1973, 2332540
Int. Cl.[2] C09B 67/00; D06P 1/62
U.S. Cl. 8—89 R 7 Claims

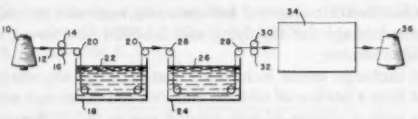
1. A concentrated storage-stable dye salt solution in an organic solvent, said solution consisting essentially of an alkylbenzenesulfonate salt, having an alkyl chain of 8 to 18 carbon atoms, of a basic dye, dissolved in an organic solvent selected from the group consisting of C_1 to C_4 alkanols, benzyl alcohol, ethylene glycol, propylene glycol, ethylene diglycol, propylene diglycol, ethylene triglycol, propylene triglycol, the phenyl or C_1 to C_4 alkyl monoethers of said glycols, acetone, methyl ethyl ketone, cyclohexanone, toluene and xylene or mixtures of said solvents, said solution containing from 20 to 75 percent by weight of said dye salt, based on the solution.

4,086,055

SURFACE MODIFIED CONTINUOUS FILAMENT YARN AND METHOD OF PRODUCING SAME

Francis William Marco, Pauline, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Oct. 4, 1976, Ser. No. 729,177
Int. Cl.[2] D06M 3/16, 5/00, 9/00
U.S. Cl. 8—130.1 13 Claims



1. A method for modifying the surface of a continuous filament twisted yarn comprising stretching said yarn to provide an elongated yarn and simultaneously contacting said elongated yarn with an effective amount of a swelling agent for a period of time effective to substantially rupture fibers on the surface of said elongated yarn without affecting interior fibers of said yarn, quenching said swelling agent, and recovering a modified continuous filament yarn.

4,086,056

PROCESS FOR IMPREGNATION OF TIMBER

Arthur Neville Hanson, Tadcaster, England, assignor to Hickson's Timber Products Limited, Castleford, England

Filed Apr. 7, 1976, Ser. No. 674,683
Claims priority, application United Kingdom, Apr. 9, 1975, 14607/75
Int. Cl.[2] B27K 3/02, 3/10, 5/00
U.S. Cl. 21—7 14 Claims

1. A process for the impregnation of at least one article comprised of timber with a predetermined amount of a treatment agent comprising the steps of:

positioning an article comprised of timber in a treatment chamber;

isolating the interior of the treatment chamber from the ambient atmosphere;

filling the treatment chamber with a treatment agent;

pressurizing the treatment agent in the treatment chamber to a predetermined level for a period not exceeding 3 minutes to rapidly force the predetermined amount of treatment agent into the article in a single pressurization step; and

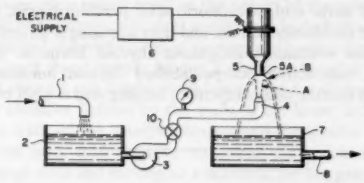
relieving the pressure of the treatment agent at the end of said single pressurization step and removing the article from the treatment chamber without substantial delay.

4,086,057

ULTRASONIC DISINFECTION SYSTEM

William Clinton Everett, 11745 Seventh Way, North (Apt. #7), St. Petersburg, Fla. 33702

Filed Jul. 28, 1976, Ser. No. 709,288
Int. Cl.[2] A61L 1/00; B05B 17/06; A23L 3/30
U.S. Cl. 21—54 A 5 Claims



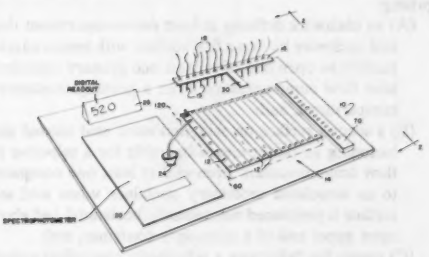
1. The method of disinfecting a liquid comprising the steps of continuously discharging a bacteria-containing liquid through a nozzle into the open atmosphere to produce a solid jet of such liquid; directing the liquid jet against an ultrasonically vibrating surface which transversely intercepts the entire cross-section of said jet to impart ultrasonic wave energy lengthwise into said jet; the velocity and cross-section area of said jet and the wave energy emanating from said surface being of such values that at least 400 joules/liter is imparted to the treated liquid.

4,086,058

ANALYTICAL SYSTEM, REAGENT DISPENSING AND SAMPLING APPARATUS AND METHOD

Betty Pendleton, 1226 S. 18th Ave., Birmingham, Ala. 35205

Continuation-in-part of Ser. No. 482,628, Jun. 24, 1974, abandoned. This application Jul. 12, 1976, Ser. No. 704,606
Int. Cl.[2] G01N 31/00
U.S. Cl. 23—230 B 9 Claims



9. Method of improved analytical testing for medical purposes comprising arranging a series of tubes into rows forming a matrix each for receiving sera and reagent, applying a portion of the mixture within the tubes to a spectrophotometer for quantitation, recording the result of the quantitation, passing the resultant mixture to an ion exchanger and membrane filter for final disposition and neutralization.

4,086,059

METHOD FOR THE ANALYSIS OF THYROID HORMONES

Howard Willner, San Anselmo, and Vito J. Mangiardi, Point Richmond, both of Calif., assignors to Bio-Rad Laboratories, Inc., Richmond, Calif.

Filed May 16, 1975, Ser. No. 578,247
Int. Cl.[2] G01N *33/16*
U.S. Cl. 23—230.3 6 Claims

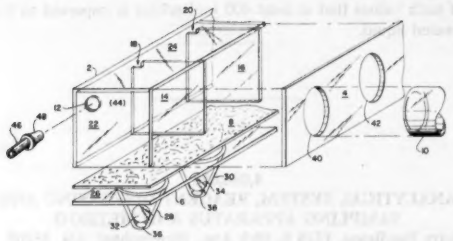
1. In a competitive binding procedure to determine the status of serum thyroid hormone in which a serum test solution is processed to separate the thyroid hormone from thyroid hormone binding protein prior to the competitive binding step, the improvement consisting essentially of adjusting the pH of the serum test solution to about 3 or lower essentially with an acid selected from the group consisting of hydrochloric acid, sulfuric acid, nitric acid, phosphoric acid, perchloric acid, formic acid and trichloracetic acid, and then admixing it directly with a solution containing exogenous thyroid hormone binding protein, radioactive isotope labelled thyroid hormone and buffer to execute said competitive binding step at a pH of about 8.6.

4,086,060

DISPOSABLE MANIPULATIVE LABORATORY DEVICE FOR TRANSFERRING BIOLOGICAL FLUIDS

William J. Hermann, Jr., Rockville, Md., assignor to Jocelyn Dickson, Potomac, Md., a part interest

Filed Oct. 22, 1976, Ser. No. 734,950
Int. Cl.[2] B65D *83/14;* G01N *1/00*
U.S. Cl. 23—259 36 Claims



1. A disposable manipulative laboratory device for transferring biological fluids and reagent mixtures from at least one primary container to an associated secondary container, comprising:

(A) an enclosure defining at least one compartment therein, said enclosure having a first surface with means adapted to receive an open end of at least one primary container for inlet flow communication from a primary container to a compartment, and;

(B) a second surface on said enclosure, said second surface including an outlet means operable for a selective outlet flow communication from said at least one compartment to an associated secondary container when said second surface is positioned substantially horizontal and above an open upper end of a secondary container, and;

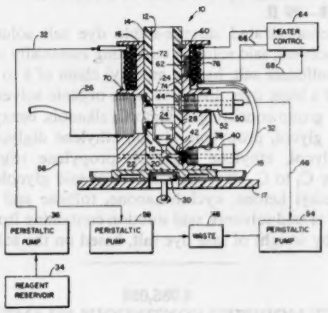
(C) means for delivering a selectively controlled volume of pressurized gas to said at least one compartment, whereby said pressurized gas is operable to transfer a selective volume of biological or reagent fluid, that has flowed into a compartment from its associated primary container, into an associated secondary container, wherein said outlet means further includes fluid valve means which is operable to close said outlet flow communication when all biological or reagent fluid within a compartment has been so transferred.

4,086,061

TEMPERATURE CONTROL SYSTEM FOR CHEMICAL REACTION CELL

Jack L. Hoffa, Brea, and Robert A. Ray, Fullerton, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 28, 1977, Ser. No. 772,410
Int. Cl.[2] G01N *33/16, 1/14*
U.S. Cl. 23—259 5 Claims



1. In combination:

a reaction cell having a chamber for receiving components of a chemical reaction for reacting at a predetermined temperature;

an inlet passage communicating with said chamber;

a reaction component reservoir;

conduit means connected between said reservoir and said inlet passage for supplying said reaction component to said chamber;

heat exchange means including a heat exchange element on at least a portion of said reaction cell and in contact with at least a portion of said conduit means for exchanging heat with said chamber and any contents thereof and for exchanging heat with said portion of said conduit means and a quantity of reaction component therein, both said heat exchange element and said portion of said conduit means being disposed to surround said portion of said reaction cell; and

means for flowing said reaction component through said conduit means toward said chamber and operative to maintain said quantity of reaction component in said portion of said conduit means for a period sufficient for said heat exchange means to drive the temperature of said reaction component toward said predetermined temperature prior to supplying said reaction component to said chamber.

4,086,062

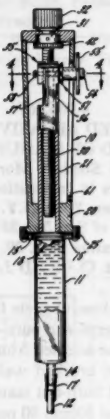
DIGITAL TITRATION DEVICE

Clifford C. Hach, Ames, Iowa, assignor to Hach Chemical Company, Ames, Iowa

Filed Feb. 23, 1977, Ser. No. 771,248
Int. Cl.[2] B01L *3/02;* B67D *5/22;* F16B *7/04*
U.S. Cl. 23—259 6 Claims

1. A liquid dispensing device for titration comprising, in combination, a frame, a plunger mounted for reciprocation in said frame from a retracted position to an extended position, a preloaded titration liquid containing cartridge having an open end sealed by a slidable piston cap and a nozzle at the opposite end, means for locking said open end of the liquid containing cartridge on said frame in a position wherein said cap receives said plunger whereby movement of the plunger from said retracted position toward said extended position expels liquid through said nozzle in said cartridge, a lead screw mounted for

rotation in said frame, means on said frame for measuring rotation of said screw, a nut for coupling said plunger to said



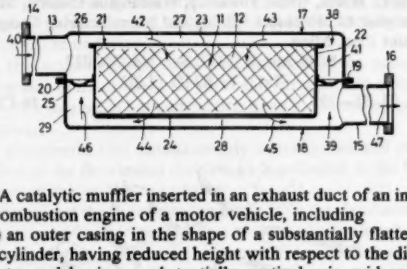
screw so that rotation of the screw reciprocates the plunger, and a control for selectively rotating said screw.

4,086,063

VERTICAL-FLOW CATALYTIC MUFFLER

Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Aug. 31, 1972, Ser. No. 285,355
Claims priority, application Italy, Aug. 31, 1971, 28068 A/71
Int. Cl.[2] B01J *8/02, 35/02;* **F01N** *1/14, 3/15*
U.S. Cl. 23—288 F **5 Claims**



1. A catalytic muffler inserted in an exhaust duct of an internal combustion engine of a motor vehicle, including

(a) an outer casing in the shape of a substantially flattened cylinder, having reduced height with respect to the diameter and having a substantially vertical axis, said casing being defined by an assembly of one each of upper and lower sheet metal half-shells connected to one another in a sealed tight manner along a line lying on the outer cylindrical surface and on a plane inclined with respect to the vertical axis, each half-shell being defined by only one piece of metal sheet and including an essentially planar wall of circular outline and a cylindrical side wall, of a height gradually decreasing and having a free edge lying on said inclined plane,

(b) a first gas inlet duct connected to the cylindrical side wall of the upper half-shell at the zone thereof of greatest height,

(c) a second gas discharge duct connected to the cylindrical side wall of the lower half-shell at the zone thereof of greatest height,

(d) a catalyst element proper, having also substantially the shape of a flattened cylinder, namely reduced height with respect to the diameter thereof, mounted in the interior of the outer casing and co-axial therewith, a side annular wall of the catalyst element being gas impervious, while upper and lower circular walls of the catalyst element are permeable to the gas, whereby the flow of the gases through the catalyst element takes place predominantly along a direction which is substantially parallel to the vertical axis of the catalyst element,

(e) a wall having inner and outer edges, said wall, having an annular shape and of corrugated metal sheet lying on the same inclined plane of the edges of said half-shells, the inner edge of said annular corrugated wall being connected to the side annular wall of the catalyst element, the outer edge of the corrugated annular wall being connected to the edges of said half-shells, (f) a chamber defined by the walls of the upper half-shell, the walls of the catalyst element and the annular corrugated wall, said chamber communicating with said inlet duct and serving as a manifold for conveying the gases towards the upper circular wall of the catalyst element, said chamber including an annular capacity positioned above said annular corrugated wall, said capacity having decreasing height, which is equal in every point to the height of the cylindrical side wall of the upper half-shell and further including a capacity positioned above the catalyst element and having a cylindrical flattened shape namely having a diameter like that of said catalyst element and height much lower than the diameter and

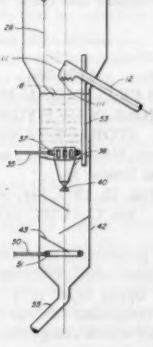
(g) a chamber defined by the walls of the lower half-shell, the walls of the catalyst element and the annular corrugated wall, said chamber communicating with the discharge duct and serving as a manifold for the gases coming out of the lower circular wall of the catalyst element, said chamber comprising an annular capacity positioned under the annular corrugated wall, said capacity having increasing height, which in every point is equal to the height of the cylindrical side wall of the lower half-shell, and further including a capacity positioned below the catalyst element and having a cylindrical flattened shape, namely having a diameter equal to that of the catalyst element, but of very reduced height with respect to the diameter.

4,086,064

APPARATUS FOR FLUIDIZED CATALYTIC CRACKING

John P. MacLean, Stafford, and John C. Strickland, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 6, 1976, Ser. No. 748,090
Int. Cl.[2] B01J *8/24*
U.S. Cl. 23—288 G **9 Claims**



1. In a fluidized catalytic cracking apparatus comprising vertical reactor vessel (15), wherein a riser conduit (12), having a discharge end (100), enters said reactor vessel (15) through a side wall thereof upwardly at an angle of about 30° to 45° to the vertical, wherein catalyst and hydrocarbon vapors flow upwardly through said riser conduit (12) and discharge

into said reactor vessel (15); an improved riser discharge head (11) comprising:

a. a body portion, connected to the discharge end (100) of said riser conduit (12);

b. foreward impingement plates (103 and 104), attached to said body portion, in an attitude normal to the flow of catalyst and hydrocarbon vapor from riser conduit discharge (100); and

c. means for directing hydrocarbon vapors and catalyst, after impingement upon said foreward impingement plate (103), substantially vertically downward into the interior of reactor vessel (15).

4,086,065

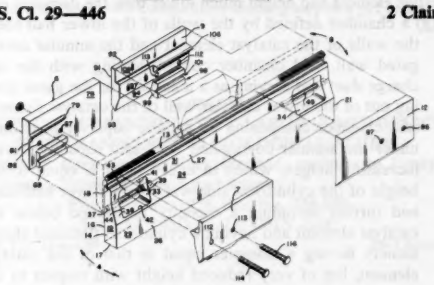
METHOD OF RIGIDIFYING WORK REST BLADE FOR CENTERLESS GRINDER

Van Q. Maxey, 17765 Casa La., Morgan Hill, Calif. 95037

Division of Ser. No. 611,651, Sep. 9, 1975. This application Jul. 29, 1977, Ser. No. 820,102

Int. Cl.² B23P *11/02*

U.S. Cl. 29—446 **2 Claims**



1. The method of rigidifying the work rest blade of a centerless grinder comprising the steps of:

(a) supporting the work rest blade on the crowned edge of an elongated support plate so that the longitudinal axis of the work rest blade extends in the same direction as the support plate;

(b) imposing a downward force on opposite ends of the work rest blade to make it conform to the crown of the supporting edge of the support plate; and

(c) simultaneously imposing rotary moments of force on opposite ends of said work rest blade acting in opposite directions whereby there is a tendency to twist the work rest blade to maintain said blade in said rigidified condition.

4,086,066

METHOD FOR PREVENTING MICROORGANISM INDUCED CORROSION OF HYDROCARBON LIQUID STORAGE TANKS

Arthur R. McDermott, Houston, Tex., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Feb. 22, 1977, Ser. No. 770,887

Int. Cl.² C10L *1/32*

U.S. Cl. 44—51 **6 Claims**

1. A method for preventing microorganism induced corrosion of a storage vessel which contains a small lower layer of water and a large upper layer of a hydrocarbon liquid by introducing a microorganism control chemical into the small lower layer of water which comprises:

(A) placing the microorganism control chemical inside a polyvinyl alcohol package;

(B) sealing the polyvinyl alcohol package;

(C) dropping the polyvinyl alcohol package into the storage vessel so that it can penetrate the large upper layer of hydrocarbon liquid and pass into the small lower layer of water; and,

(D) permitting the polyvinyl alcohol package to dissolve in the water thereby releasing the microorganism control chemical.

4,086,067

POROUS SINTERED ABRASIVE ARTICLES AND METHOD OF MANUFACTURE

John Folts Busch, and Stephen Morrison Freeman, both of Tiffin, Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 557,472, Mar. 12, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,135

Int. Cl.² B24D *3/34*

U.S. Cl. 51—296 **16 Claims**

1. A porous sintered abrasive grain formed from a mixture of aluminous abrasive material and burn-out material, where said burn-out material may be selected from pieces of material such as paradichlorobenzene, crushed walnut shells, cork, plastic and mustard seeds, said burn-out material having a cross-section lying between about 20 and 80 percent of the grain cross-section and being present in the mixture in a volume percent between about 3.5 and 20.

7. An organic resin bonded grinding wheel comprising a plurality of the sintered aluminous abrasive grains of claim 1.

4,086,068

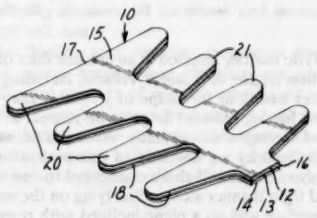
LENS GRINDING AND POLISHING LAP COVER AND METHOD OF MAKING SAME

David C. Hedin, Grant Township, Washington County,, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Apr. 8, 1977, Ser. No. 786,027

Int. Cl.² B24D *11/02*

U.S. Cl. 51—395 **16 Claims**



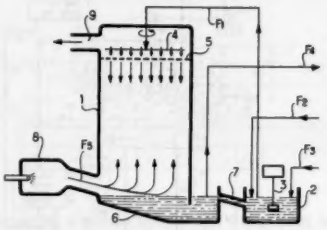
1. A lap cover for a curved surface lap for grinding lens blanks comprising a substrate sheet of flexible conformable material and a coating of adhesive on one side of the substrate for adhering the substrate to the curved lap surface, said lap cover having an elongate body portion having a longitudinal axis within said elongate body, a leading end edge and a terminal end edge and having a plurality of spaced integral elongate appendage portions projecting from the side edges of the body portion and no part of any appendage portion extends beyond said leading end edge, wherein the ends of the slots between said appendage portions define the side edges of the elongate body portion and said side edges do not cross said longitudinal axis, the shape of each of said elongate appendage portion being such that the appendage portions of an adhesively bonded lap cover do not tear away as the leading end of the body portion is stripped back toward the terminal end during removal.

4,086,069

METHOD FOR SIMULTANEOUSLY CONCENTRATING AND PURIFYING PHOSPHORIC ACID

Joseph Sergot, Croissy-sur-Seine, France, assignor to Prorea S.A., Levallois-Perret, France

Filed Feb. 9, 1976, Ser. No. 656,466
Claims priority, application France, Feb. 25, 1975, 75 05791
Int. Cl.[2] B01D *19/00*
U.S. Cl. 55—48 5 Claims



1. A method for simultaneously concentrating and purifying an aqueous phosphoric acid solution of fluorinated derivatives, consisting of effecting continuously the following operations:

(1) the aqueous phosphoric acid solution to be simultaneously concentrated and purified is introduced into an enclosure or tower;

(2) the aqueous phosphoric acid solution to be simultaneously concentrated and purified is brought into contact with a current of hot combustion gases in the enclosure or tower;

(3) phosphoric acid simultaneously concentrated and purified of the fluorinated derivatives is collected at the bottom of the enclosure or tower;

(4) water and the fluorinated resulting from the simultaneous concentration and purification of the aqueous phosphoric acid solution are removed substantially at the top of the enclosure or tower as are the combustion gases;

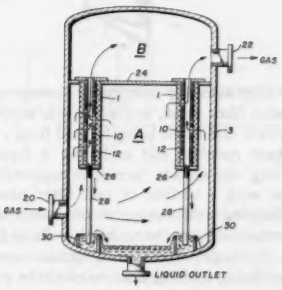
(5) wherein prior to introducing the aqueous phosphoric acid solution to be simultaneously concentrated and purified into the enclosure or tower, the aqueous phosphoric acid solution to be simultaneously concentrated and purified is formed by raw aqueous phosphoric acid solution being mixed with water and with a fraction of the concentrated and purified phosphoric acid collected at the base of the enclosure or tower, the balance of the simultaneously concentrated and purified collected phosphoric acid being removed from the enclosure or tower as product, wherein the ratio by weight of the amount of the raw aqueous phosphoric acid solution to be simultaneously concentrated and purified and the amount of the water mixed therewith is greater than 1.5 to 1, and wherein there is added from 7 to 17 parts by weight of the concentrated and collected purified phosphoric acid to the aqueous phosphoric acid solution being passed to the enclosure or tower to be simultaneously concentrated and purified per 1 part by weight of concentrated and collected purified phosphoric acid removed from the enclosure or tower as product.

4,086,070

FIBER BED SEPARATOR AND METHOD FOR SEPARATION OF AEROSOLS FROM GASES WITHOUT RE-ENTRAINMENT

Wesley B. Argo, Town & Country; Gilbert K. C. Chen, Manchester; Babur M. Kocatas, Clayton, and Steven A. Ziebold, Mehlville, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 642,921, Dec. 22, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,291
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—97 21 Claims



1. In a process for removing aerosols of less than 3 microns from a moving gas stream in a fiber bed separator wherein said aerosol containing gas is caused to flow substantially horizontally through a substantially vertical non-matting bed of randomly distributed fibers having a mean diameter of at least about 5 microns and packed to a substantially uniform bed voidage of from about 85 to 98%, resulting in separation of a substantial proportion of the aerosol from the gas as a collected liquid phase, an improvement whereby re-entrainment of said liquid phase from the downstream surface of said fiber bed is substantially prevented, said improvement comprising:

(a) providing a second fiber bed in intimate fiber to fiber contact with said substantially vertical non-matting bed of randomly distributed fibers, hereinafter referred to as said first fiber bed, such that an interface is formed between said first and second fiber beds,

(b) causing said aerosol containing gas to flow through said first fiber bed under non-flooding conditions for the aerosol loading contained in said gas, said first fiber bed being selected such that the residual saturation of said first fiber bed against gas phase drag of the liquid phase is less than the residual saturation of said first fiber bed against gravity drainage of the liquid phase,

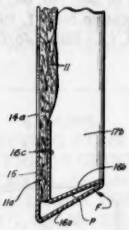
(c) continuing the substantially horizontal flow of said gas, now substantially free of aerosol particles, through said second fiber bed, said second fiber bed being a substantially vertical non-matting bed of randomly distributed fibers packed to a bed voidage of from about 85 to 99%, the mean fiber diameter and voidage of said second fiber bed being selected such that the residual saturation of said second fiber bed against gas phase drag of the liquid phase is greater than the residual saturation of said second fiber bed against gravity drainage of the liquid phase, and

(d) continuously draining the collected liquid phase from said interface between said first and second fiber beds such that the liquid drains by gravity flow through said second fiber bed or at said interface.

4,086,071
AIR FILTER ASSEMBLY

Charles L. Champlin, Rittman, Ohio, assignor to Packaging Corporation of America, Evanston, Ill.

Filed Aug. 9, 1976, Ser. No. 712,588
Int. Cl.[2] B01D *46/10*
U.S. Cl. 55—501 5 Claims



1. An air filter assembly comprising a compressible air previous multisided filter panel, and a frame in supporting engagement therewith; said frame being formed from a single blank of foldable sheet material and including a foraminous center section having one surface thereof in supporting face-to-face engagement with a surface of said filter panel, a marginal section delimiting said center section and having portions thereof corresponding to the multisides of said filter panel, and a plurality of elongated peripheral sections arranged in alternate sets and being foldably connected to the periphery of the marginal section, each peripheral section having a segment coacting with a portion of said marginal section to fixedly sandwich and compress therebetween and edge portion of said filter panel, said peripheral sections being foldably adjustable relative to one another from an inoperative position to an operative position, said peripheral sections, when in said inoperative position, having one alternate set of peripheral sections overlapping a second alternate set of peripheral sections and said sets assuming a collapsed substantially overlapping relation with respect to the filter panel compressed edge portions and, when said peripheral sections are adjusted to said operative position, said second alternate sets of peripheral sections having tab-like end portions automatically aligned with and inserted into adjacent openings formed in the ends of the adjacent said one alternate set of peripheral sections and effecting interlocking of said peripheral sections in corner-forming relation whereby a substantially continuous flange is formed projecting angularly away from a plane including said marginal section; the peripheral sections of each alternate set, when in operative position, projecting angularly from the marginal section towards said foraminous center section to form an acute included angle whereby an elongated edge of each peripheral section overlies in spaced relation an adjacent portion of the marginal section.

4,086,072
AIR SOURCE HEAT PUMP WITH MULTIPLE SLIDE ROTARY SCREW COMPRESSOR/EXPANDER

David N. Shaw, Unionville, Conn., assignor to Dunham-Bush, Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 653,568, Jan. 29, 1976. This application Mar. 30, 1977, Ser. No. 782,675
Int. Cl.[2] F25B *27/00;* G05D *23/00*
U.S. Cl. 62—2 27 Claims

1. In an air source heat pump system including:

a helical screw rotary compressor including a suction port and a discharge port,

a helical screw rotary expander including a feed port and a discharge port,

means for mechanically connecting said expander to said compressor,

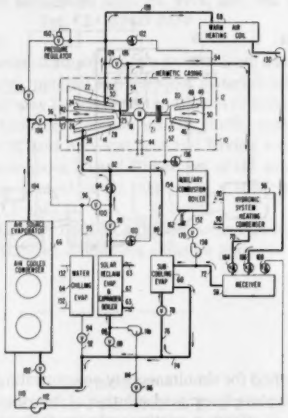
a first inside heat exchange coil for conditioning a building and the like,

a second outside heat exchange coil connecting an air source evaporator/air cooled condenser,

said compressor comprising a plurality of axially adjustable compressor slide valves including at least a capacity control slide valve for unloading the compressor, an injection slide valve including an injection port, and an ejection slide valve including an ejection port,

conduit means carrying refrigerant and forming a primary closed loop refrigeration circuit for connecting; at least said screw compressor and said first and second coils in series in that order,

the improvement wherein:



said system further includes a third heat exchange coil connected intermediate of said first and second coils with the outlet side of said third heat exchange coil being connected to the injection port of said injection slide valve,

and wherein said conduit means further comprises means connecting the outlet side of said third heat exchange coil additionally to the feed port of said expander, and means for connecting the discharge port of said expander to said first heat exchange coil, and selectively operated valve means within said conduit means connecting the outlet of said third heat exchange coil to said injection slide valve injection port for preventing refrigerant return flow from said third heat exchange coil to said compressor and forcing such refrigerant return flow to enter said expander feed port.

4,086,073
ELECTROLYTIC ION MIGRATION INTO GLASS

David Gordon Loukes, Prescot, England, assignor to Pilkington Brothers Limited, St. Helens, England

Filed Feb. 2, 1977, Ser. No. 764,959
Claims priority, application United Kingdom, Feb. 5, 1976, 4601/76
Int. Cl.[2] C03B *18/02;* C03C *21/00*
U.S. Cl. 65—30 E 20 Claims

1. A process for modifying the surface of glass while the glass is at a temperature at which it is susceptible to surface modification by electrolytic migration of ions, comprising:

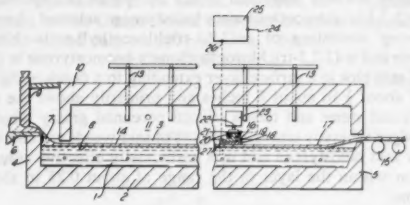
(a) maintaining a molten alloy body, comprising at least two metals which are to migrate into the glass in a predetermined ratio, in contact with the glass surface, at a location where the temperature is least 600° C, by means of a locating member having a locating face to which the molten body clings, which face comprises at least said two

metals in the same ratio in which said metals are to migrate into the glass from the molten body;

(b) electrolytically causing migration of ions of said at least two metals from the molten body into the glass in said predetermined ration by applying an electrical potential across the glass so as to produce an electric flux density of at least 270 coulombs per square meter of the glass surface; and

(c) replenishing the molten body by dissolving of said at least two metals into the molten body from said locating face.

20. A process for modifying the surface of glass while the glass is at a temperature at which it is susceptible to surface modification the migration of ions, comprising:



(a) maintaining a molten alloy body, comprising at least two metals which are to migrate into the glass in a predetermined ratio, in contact with the glass surface at a location where the temperature is at least 600° C by means of a locating member having a locating face to which the molten body clings, which face comprises at least said two metals in the same ratio in which said metals are to migrate into the glass from the molten body;

(b) regulating the concentration of oxygen in the molten body to cause migration of ions of said at least two metals from the molten body into the glass in said predetermined ratio; and

(c) replenishing the molten body by dissolving of said at least two metals into the molten body from said locating face.

4,086,074

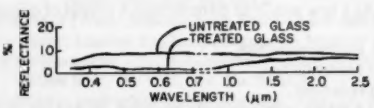
ANTIREFLECTIVE LAYERS ON PHASE SEPARATED GLASS

Michael Jay Minot, and Ugur Ortabasi, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Jan. 22, 1976, Ser. No. 651,416

Int. Cl.² C03C *15/00*

U.S. Cl. 65—31 **6 Claims**



1. A method of forming a porous antireflective surface layer on a glass article which comprises the steps of:

providing an article of phase-separable glass which, upon heat treatment, is capable of separating into at least two phases of different solubility,

heating the glass article to a temperature under the phase separation liquidus temperature, said temperature being sufficiently high and being applied for a sufficient duration of time to enhance phase separation in said glass; and thereafter

contacting said glass article with a treating solution for a time sufficient to leach from a surface layer of said article the most soluble of said phases, at least the least soluble of said phases remaining as a porous skeletonized layer which is less than 10,000A in thickness and which exhibits a gradient refractive index across the thickness of the larger.

4,086,075

METHOD OF MANUFACTURING AN ARTICLE CONTAINING AT LEAST ONE GLASS PART IN WHICH A METAL PART IS SEALED IN

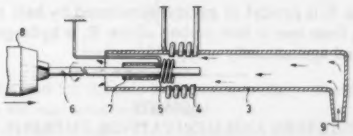
Tjepke Hendrik Ekkelboom, and Thomas Geeven, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 594,029, Jul. 8, 1975, abandoned. This application Dec. 3, 1976, Ser. No. 747,349

Claims priority, application Netherlands, Jul. 12, 1974, 7409432

Int. Cl.² C03C *27/02*

U.S. Cl. 65—40 **7 Claims**



1. A method of manufacturing an article which includes at least one glass part in which a metal part is sealed which comprises: providing an elongated metal part; shaping a quantity of glass in the form of a tube which internally has about the same shape and cross-section as the metal part; slipping the glass tube onto the metal part and heating the resulting assembly by passing it through a high-frequency electric field, said heating step including providing only an open electrically conducting winding through which winding the assembly is passed, said heating step being performed in a non-oxidizing shielding gas.

4,086,076

TETRAHYDROFURANYL BROMOACETATES USED AS BIOCIDES

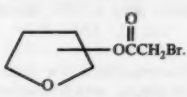
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 652,040, Jan. 26, 1976, abandoned, which is a division of Ser. No. 564,517, Apr. 2, 1975, Pat. No. 3,953,473. This application Mar. 31, 1977, Ser. No. 783,136

Int. Cl.² A01N *9/00, 9/28*

U.S. Cl. 71—67 **4 Claims**

1. The method of controlling bacteria, fungi and algae comprising applying to the habitat thereof a biocidally effective amount of a compound having the formula



4,086,077

COMBATING UNWANTED VEGETATION WITH 1,3,4-THIADIAZOLYLUREAS

William C. Doyle, Jr., Leawood, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation of Ser. No. 29,671, Apr. 17, 1970, abandoned. This application Oct. 28, 1975, Ser. No. 626,587

Int. Cl.² A01N *9/12*

U.S. Cl. 71—90 **1 Claim**

1. The method of combating unwanted vegetation by applying to the locus of the vegetation an effective amount of 1,3-dimethyl-1-(5-tert.butyl-1,3,4-thiadiazol-2-yl)urea.

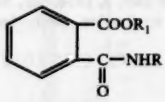
4,086,078

USE OF PYRIDYL PHTHALAMIC ACIDS AS PLANT GROWTH REGULANTS

Frederic G. Bollinger, and John J. D'Amico, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1976, Ser. No. 753,393
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—94 2 Claims

1. A method of regulating the growth of leguminous plants which comprises treating said plants with an effective non-lethal amount of a compound having the formula



wherein R is pyridyl or pyridyl substituted by halo or alkoxy having from one to four carbon atoms; R_1 is hydrogen, lower alkyl and agriculturally acceptable cations.

4,086,079

SULFIDES AND DERIVATIVES THEREOF AS ABSCISSION AGENTS

Geneva Gail Otten, Colerain Township, Hamilton County; Tom Conrad Rheinecker, Green Township, Hamilton County, and Ted Joe Logan, Colerain Township, Hamilton County, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 676,832, Apr. 14, 1976, abandoned. This application Jul. 30, 1976, Ser. No. 710,354
Int. Cl.[2] A01N 9/14
U.S. Cl. 71—103 12 Claims

1. A method of inducing fruit abscission comprising applying to fruit bearing plants an effective amount of agent having the structural formula

RXR'

wherein R' is selected from the group consisting of methyl and ethyl, wherein X is selected from the group consisting of sulfide, sulfoxide and sulfone; and R is alkyl or alkenyl having 10–12 carbon atoms when X is sulfide or sulfoxide and 8–14 carbon atoms when X is sulfone.

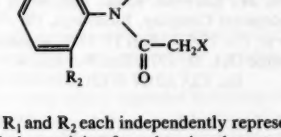
4,086,080

HALOGENO-ACETANILIDES AS HERBICIDES

Jean Claude Tournayre, Basel, and Christian Vogel, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 284,203, Aug. 28, 1972, Pat. No. 4,025,554. This application Mar. 2, 1977, Ser. No. 773,589
Int. Cl.[2] A01N 9/20
U.S. Cl. 71—118 14 Claims

1. A herbicidal composition for selectively combatting weeds in cultivated plants, which comprises as active substance a herbicidally effective amount of a substituted halogeno-acetanilide of the formula 1



(I)

wherein R_1 and R_2 each independently represents hydrogen or lower alkyl containing from 1 to 4 carbon atoms, R_3 represents hydrogen or the methyl group, R_4 represents cycloalkyl containing from 3 to 5 carbon atoms, and X represents chlorine or bromine, together with a suitable carrier therefor.

4,086,081

CONTROL OF SEDGES AND PERENNIAL GRASSY WEEDS WITH META-HALOSTYRENE DERIVATIVES

Keith C. Barrons, Holmes Beach, Fla.; Leonard L. Smith, Jr., Greenville, Miss., and Theodore W. Holmsen, Clayton, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 17, 1976, Ser. No. 751,631
Int. Cl.[2] A01N 9/32
U.S. Cl. 71—126 14 Claims

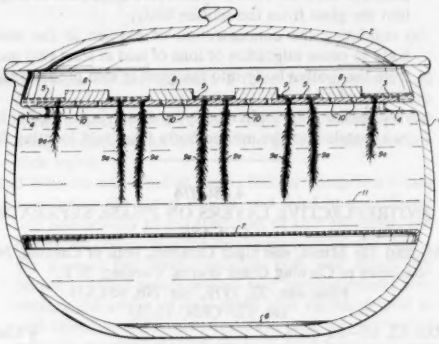
1. The method of preemergently controlling weeds selected from perennial grassy weeds and sedges in a field plot significantly infested therewith which comprises incorporating an α-(2,2,2-trichloroethyl)-meta-halostyrene selected from the group consisting of α-(2,2,2-trichloroethyl)-meta-chlorostyrene and α-(2,2,2-trichloroethyl)-meta-bromostyrene in the soil of said plot in a surface layer extending to a depth in the range of about ½ to about 6 inches and primarily above the underground stems and tubers of said perennial grassy weeds and sedges whereby emerging shoots of said weeds are intercepted by said halostyrene and in a herbicidally effective concentration within the layer in the range of about 0.25 to about 50 ppm.

4,086,082

COPPER CRYSTAL AND PROCESS

Shalom Mahalla, P.O. Box 11183, Phoenix, Ariz. 85017

Filed Apr. 16, 1976, Ser. No. 677,690
Int. Cl.[2] B22F 9/00; C22B 15/12
U.S. Cl. 75—.5 A 3 Claims



1. As a new article of manufacture, a crystal of copper which is

(a) macrocrystalline,
(b) unicrystalline,
(c) columnar,
(d) a single prime particle bounded by at least two sets of distinguishable (100) planes which are determined by the internal crystal structure, the crystal orientation being such that
(1) a (110) plane is perpendicular to the long axis of the crystal, and
(2) a (111) plane is perpendicular to the the smallest cross-section thereof,

said sets of planes defining a plurality of parallel, non-coplanar macroscopic facets, which microscopically are crystallographic step-growth surfaces.

2. A method for manufacturing crystals of a product metal, including the steps of:

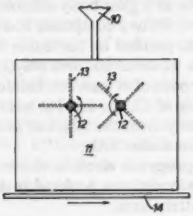
(a) providing an aqueous pregnant solution of a compound of said product metal in a crystallization zone;
(b) establishing and maintaining a concentration step-function of said product metal compound in said zone;

(c) contacting said solution with a reagent metal higher than said product metal in the EMF series, said reagent metal contacting said solution in the region of the lowest product metal compound concentration;
(d) continuously maintaining metal deposited
(e) removing the oxidized byproduct of the precipitation reaction from said solution;
the establishment and maintenance of said concentration step-function thereby inducing the formation of crystals of said product metal which are macrocrystalline, unicrystalline, and columnar.

4,086,083
RECOVERING MATERIAL

Anthony Dennis Michael, London; John Albert White, South Harrow, and Gerald Louis Griffin, Northolt, all of England, assignors to The Glacier Metal Company Limited, England

Filed Jan. 14, 1977, Ser. No. 759,567
Int. Cl.² C22B *25/06*
U.S. Cl. 75—64 **5 Claims**



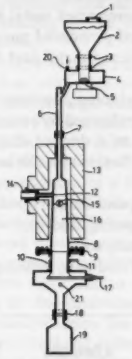
1. A method for recovering a tin-containing alloy layer from a multilayered material comprising in adjacent layers a steel layer, an intermediate aluminum foil layer and said tin-containing alloy layer which comprises;
heating said multilayered material to a temperature of at least the melting point of tin but below the melting point of said tin-containing alloy, for a time sufficient to allow the molten tin to penetrate said aluminum foil layer and to come into contact with said steel layer, but for insufficient time for aluminum and steel to alloy between said aluminum foil layer and said steel layer;
and thereafter subjecting said multilayered material in said heated state to repetitive mechanical shocks to effect separation of said steel layer from said aluminum foil layer.

4,086,084
REFINING OF METALS

Raymond Edward Oliver, Johannesburg, South Africa, and John Blunden Payne, London, England, assignors to Matthey Rustenburg Refiners (Pty) Ltd., Johannesburg, South Africa

Filed Mar. 18, 1975, Ser. No. 559,424
Claims priority, application United Kingdom, Mar. 21, 1974, 12597/74
Int. Cl.² C22B *11/00*
U.S. Cl. 75—118 R **11 Claims**

1. A process for refining a mineral concentrate which comprises a mixture of at least one precious metal selected from the group consisting of gold, ruthenium, rhodium, palladium, osmium, iridium and platinum; silver and a base metal which forms a volatile halide so as to separate the silver and base metal from the precious metal, said base metal being selected from the group consisting of Sb, Sn, Pb, Zn, Cu, Ni, Fe, As, Se and Te; said process comprising:
(a) contacting the mixture of base metal, silver and precious metal, any of which may be in metallic or chemically combined form, while said mixture is maintained in solid particulate form with a halogen-containing gas selected from the group consisting of hydrogen chloride, hydrogen bromide, chlorine and bromine at a temperature below the melting point of the mixture but which is sufficiently high for the base metal and silver to form their



halides and for the said halides substantially to volatilize from the said solid mixture, and
(b) removing the said volatilized halides from the solid precious metal which remains.

4,086,085
AUSTENITIC IRON ALLOYS

James A. McGurty, 101 J Colonial Dr., Reading, Pa. 19607

Continuation-in-part of Ser. No. 737,758, Nov. 2, 1976, abandoned, which is a continuation-in-part of Ser. No. 537,357, Dec. 30, 1974, abandoned. This application Apr. 18, 1977, Ser. No. 788,396
Int. Cl.² C22C *38/06*
U.S. Cl. 75—124 **8 Claims**

1. A high temperature yttrium-free, austenitic iron alloy which forms an aluminum oxide film which is protective of the base metal to 1700° F in air consisting essentially of 20.0 weight percent of nickel, 15.0 weight percent chromium, 4.5 weight percent of aluminum and the balance consisting essentially of iron.

4,086,086
CAST IRON

John Victor Dawson, Stratford-upon-Avon, England, and Michael John Lalich, Downington, Pa., assignors to British Cast Iron Research Association, Birmingham, England

Filed Feb. 3, 1977, Ser. No. 765,394
Claims priority, application United Kingdom, Feb. 10, 1976, 05083/76
Int. Cl.² C22C *33/08, 33/00*
U.S. Cl. 75—130 R **12 Claims**

1. A method of treating molten carbon-containing iron to produce a cast iron with a compacted graphite structure comprising adding to the molten iron in a single step a quantity of an alloy containing silicon, magnesium, titanium, calcium and a rare earth, the balance being iron.

4,086,087
PROCESS FOR THE PREPARATION OF POWDERED METAL PARTS

Lisa Marie Morris, 24608 Chancel, Mount Clemens, Mich. 48043

Filed Dec. 27, 1976, Ser. No. 754,185
Int. Cl.² B22F *3/00, 3/24*
U.S. Cl. 75—200 **12 Claims**

1. A process for producing powdered metal parts comprising the steps:

a. Preforming powdered metal parts by pressing and sintering into a desired shape;
b. Impregnating said preformed part with a liquid which is immiscible with a lubricant;
c. Contacting said impregnated metal part with a lubricant;
d. Sizing the lubricated powdered metal part; and
e. Washing said powdered metal part to remove said lubricant.

6. In a process for producing powdered metal parts wherein the powdered metal is preformed by pressing and sintering into a powdered metal part of a desired shape; contacted with a lubricant; and sized to a final shape, the improvement comprising:

A. Prior to contacting said shaped powdered metal part with a lubricant, impregnating said part with a liquid immiscible with the lubricant; and

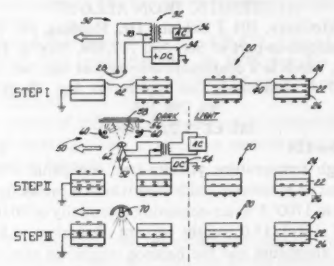
B. After final sizing of said part, washing said part to remove said lubricant.

4,086,088

IMAGING METHODS FOR USE WITH CHARGED PARTICLE MODULATOR DEVICE

Ival Lee Toepke, Newbury, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 25, 1976, Ser. No. 670,345
Int. Cl.[2] G03G *13/24*
U.S. Cl. 96—1 R **14 Claims**



1. The method of producing a charge distribution system corresponding to the graphic subject matter of a graphic original on a modulator structure formed by an electrically conductive screen sandwiched between a photoconductive top layer and an electrically insulating layer having a resistivity greater than 10^{15} ohm centimeters, said photoconductive layer when dark adapted having a blocking junction relative the conductive substrate blocking the passage of charge particles, comprising the steps of:

applying a uniform electrostatic charge of a first polarity to said photoconductive top layer;

applying the surface of said photoconductive top layer with DC charges of such a magnitude and oppositely poled to the charges of said first polarity simultaneous with the projection of a pattern of light and shadow produced from illuminating said graphic original producing dark and light exposed zones on said modulator rendering the photoconductive layer conductive in the light exposed zones and reversing the charges in the dark zones creating charge patterns on the photoconductive layer and on the insulating layer;

flood irradiation of the top photoconductive layer with electromagnetic radiation of the type to which the photoconductive layer is responsive;

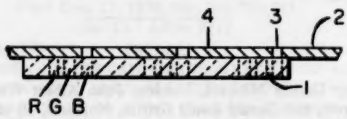
whereby said charge distribution system is created on the insulating layer comprised of charges of one polarity in the dark zones and oppositely poled charges in the light zones.

4,086,089

METHOD FOR PRODUCING TRI-COLOR SCREENS FOR TELEVISION PICTURE TUBES

Thomas Philip Seward, III, and Brent Merle Wedding, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,383
Int. Cl.[2] G03C *5/04, 5/00, 7/00, 15/00*
U.S. Cl. 96—27 R **38 Claims**



1. A method for preparing a patterned, integrally-colored, transparent, tri-color glass screen for the face plate of a color television picture tube comprising the steps of:

(a) forming a glass body suitable as a face plate for a television picture tube or a glass body suitable for attachment to said face plate to form a composite body consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 10–20% Na_2O, 0.0005–0.3% Ag, 1–4% F, an amount of at least one halide selected from the group consisting of Cl, Br, and I at least sufficient to react stoichiometrically with the Ag, but not more than about 3%, and the remainder SiO_2;

(b) placing an appropriate electron shadow mask in contact with said glass body at a position to expose about one-third of the pattern area;

(c) subjecting said one-third of the pattern area to high energy or actinic radiation for a period of time sufficient to develop a latent image therein leading to the production of a first integral color therein selected from the group of red, green, and blue;

(d) moving the shadow mask and/or the glass body a distance equal to about one-third of the hole separation in said shadow mask;

(e) subjecting a second one-third of the pattern area to high energy or actinic radiation for a period of time sufficient to develop a latent image therein leading to the production of a second integral color therein selected from the group of red, green, and blue; which is different from the color produced by step (c)

(f) moving the shadow mask and/or the glass body another distance equal to about one-third of the hole separation in said shadow mask;

(g) subjecting a third one-third of the pattern area to high energy or actinic radiation for a period of time sufficient to develop a latent image therein leading to the production of a third integral color therein selected from the group of red, green, and blue; which is different from the colors produced by steps (c) and (e)

(h) heating said glass article to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause nucleation and growth of microcrystals of alkali metal fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide in the areas of said latent image;

(i) subjecting at least said previously-exposed portions of said glass body to high energy or actinic radiation while at least said portions are at a temperature between about 200°–410° C. for a sufficient length of time to cause metallic silver to be deposited as discrete colloidal particles less than about 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said

microcrystals having a concentration of at least 0.005% by volume and causing the integral red, green, and blue coloration; and then

(j) cooling said glass body to ambient temperature.

23. A method for preparing a patterned, integrally-colored, transparent, tri-color glass screen for the face plate of a color television picture tube comprising the steps of:

(a) forming a glass body suitable as a face plate for a television picture tube or a glass body suitable for attachment to said face plate to form a composite body consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 10–20% Na_2O, 0.0005–0.3% Ag, 1–4% F, an amount of at least one halide selected from the group consisting of Cl, Br, and I at least sufficient to react stoichiometrically with the Ag, but not more than about 3%, and the remainder SiO_2;

(b) placing an electron shadow mask at an appropriate uniform distance from said glass body;

(c) directing collimated high energy or actinic radiation through said mask toward said glass body at the proper angle to expose about one-third of the pattern area for a period of time sufficient to develop a latent image therein leading to the production of a first integral color therein selected from the group of red, green, and blue;

(d) directing collimated high energy or actinic radiation through said mask toward said glass body at the proper angle to expose a second one-third of the pattern area for a period of time sufficient to develop a latent image therein leading to the production of a second integral color therein selected from the group of red, green, and blue; which is different from the color produced by step (c)

(e) directing collimated high energy or actinic radiation through said mask toward said glass body at the proper angle to expose a third one-third of the pattern area for a period of time sufficient to develop a latent image therein leading to the production of a third integral color therein selected from the group of red, green, and blue; which is different from that colors produced by steps (c) and (d)

(f) heating said glass body to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause nucleation and growth of microcrystals of alkali metal fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide in the areas of said latent image; (g) subjecting at least said previously-exposed portion of said glass body to high energy or actinic radiation;

(h) heating said glass body to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume and causing the integral red, green, and blue coloration, and then

(i) cooling said glass body to ambient temperature.

31. A method for preparing a patterned, integrally-colored, transparent, tri-color glass screen for the face plate of a color television picture tube, wherein said face plate has an overall green background, comprising the steps of:

(a) forming a glass body suitable as a face plate for a television picture tube or a glass body suitable for attachment to said face plate to form a composite body consisting essentially, in weight percent on the oxide basis as calculated from the batch, of about 10–20% Na_2O, 0.0005–0.3% Ag, 1–4% F, an amount of at least one halide selected from the group consisting of Cl, Br, and I at least sufficient to react stoichiometrically with the Ag, but not more than about 3%, and the remainder SiO_2;

(b) subjecting said glass body to high energy or actinic radiation for a period of time sufficient to develop a latent image therein leading to the production of an integral green color therein;

(c) placing an electron shadow mask at an appropriate uniform distance from said glass body;

(d) directing collimated high energy or actinic radiation through said mask toward said glass body at the proper angle to expose about one-third of the pattern area for a period of time sufficient to develop a latent image therein leading to the production of a first integral color therein selected from the group of red and blue;

(e) directing collimated high energy or actinic radiation through said mask toward said glass body at the proper angle to expose a second one-third of the pattern area for a period of time sufficient to develop a latent image therein leading to the production of a second integral color therein selected from the group of red and blue; which is different from the color produced by step (d)

(f) heating said glass body to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause nucleation and growth of microcrystals of alkali metal fluoride containing at least one silver halide selected from the group consisting of silver chloride, silver bromide, and silver iodide in the areas of said latent image;

(g) subjecting said glass body to high energy or actinic radiation;

(h) heating said glass body to a temperature between about the transformation range of the glass and the softening point thereof for a sufficient length of time to cause metallic silver to be deposited as discrete colloidal particles less than 200A in the smallest dimension, and/or deposited within said microcrystals, the silver-containing part of the microcrystal being less than about 200A in the smallest dimension, and/or deposited on the surface of said microcrystals, the portion of the microcrystal coated with silver being less than about 200A in the smallest dimension, said microcrystals having a concentration of at least 0.005% by volume and causing the integral red, green, and blue coloration; and then

(i) cooling said glass body to ambient temperature.

4,086,090

FORMATION OF PATTERN USING ACRYLAMIDE-DIACETONEACRYLAMIDE COPOLYMER

Takahiro Kohashi; Motoo Akagi; Yoichi Oba, all of Hachioji; Saburo Nonogaki, Tokyo; Makoto Tanaka, Koganei; Tadao Kaneko, Tokyo, and Yoshifumi Tomita, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 484,321, Jun. 28, 1974, abandoned. This application Sep. 22, 1975, Ser. No. 615,529

Claims priority, application Japan, Jul. 25, 1973, 48-83172

Int. Cl.[2] **G03C** *5/00*

U.S. Cl. 96—35.1 **25 Claims**

1. A process for forming a pattern, which comprises the steps of:

a. preparing a photoresist layer consisting essentially of an acrylamide-diacetoneacrylamide copolymer and a water-soluble aromatic bisazide compound on a surface for the pattern, said layer having the reciprocity law failure property,

b. applying light to said photoresist layer by passing the light through a mask having said pattern to harden the photoresist layer at a surface area substantially equal to or smaller than that of apertures of said mask through which beams pass; said light being applied in the presence of an oxygen-containing gas, and with Schwartzschild's constant p being in the range of greater than 0 and smaller than 0.76, and

c. developing the light-applied photoresist layer to form the pattern having a surface area substantially equal to or smaller than that of apertures of said mask through which beams pass.

4,086,091

METHOD OF APPLYING AND CURING EPOXY COATING COMPOSITIONS USING DICARBONYL CHELATE OF GROUP IIIA-VA ELEMENT AND UV IRRADIATION

James A. Cella, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

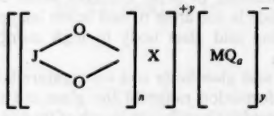
Filed May 20, 1977, Ser. No. 798,784
Int. Cl.[2] B05D 3/06; C08G 59/70
U.S. Cl. 96—36.2 16 Claims

1. A method for coating a substrate which comprises

(1) applying onto the substrate a composition comprising

(A) an epoxy resin polymerizable to a high molecular weight state selected from epoxy monomer, epoxy prepolymer, oxirane containing organic polymer and mixtures thereof, and

(B) an effective amount of a 1,3-dicarbonyl chelate of the formula,



where X is a main row element selected from Group IIIa, IVa and Va, J is a divalent organo radical having 3 to 42 carbon atoms, M is an element selected from Sb, As, P and B, and Cl, Q is halogen or oxygen, *n* is an integer equal to 2 or 3, y is an integer equal to 1 or 2, and *a* is an integer equal to 4 to 6 or the valence of M,

(2) subjecting the resulting treated substrate of (1) to ultraviolet radiation until a tack-free cured coating is obtained on said substrate.

4,086,092

PROCESS FOR MAKING PHOTOSENSITIVE LITHOGRAPHIC PRINTING PLATES INVOLVING SEQUENTIALLY COATING WITH POTASSIUM ZIRCONIUM FLUORIDE AND SODIUM SILICATE

Eugene Golda, Monsey, and Alan Leonard Wilkes, Brewster, both of N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Apr. 18, 1977, Ser. No. 788,216
Int. Cl.[2] G03C 1/94
U.S. Cl. 96—86 R 9 Claims

1. A method for preparing lithographic printing plates which comprises first coating at least one surface of a metal sheet substrate with an aqueous solution of potassium zirconium fluoride, subsequently treating the coated substrate with an aqueous solution of sodium silicate and then applying to the thus treated substrate a lithographically suitable photosensitive composition.

7. The method of claim 1 wherein the photosensitive composition contains a photosensitizing agent selected from the group consisting of aromatic diazo compounds, azidopyrenes, benzoquinone diazides, naphthoquinone diazides, polyacetals which depolymerize under ultraviolet radiation, polymonochloroacetaldehyde, polypropionaldehyde, poly-n-butyraldehyde, poly-cyano-acetaldehyde, poly-B-cyanopripionaldehyde, poly-cyano-pentaldehyde, polycycnovaleraldehyde, poly-n-butyraldehyde, poly-isobutyraldehyde, polyvaleraldehyde and polyheptaldehyde.

4,086,093

DRY PLANOGRAPHIC PRINTING PLATE

Yuh Ezumi, Kyoto; Masaharu Kobayashi; Takashi Kubota, and Yoichi Shimokawa, all of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 514,063, Oct. 11, 1974, abandoned.
This application Aug. 11, 1976, Ser. No. 713,576
Int. Cl.[2] G03G 1/68
U.S. Cl. 96—86 P 14 Claims

1. A negative acting presensitized dry planographic printing place comprising:

(a) a flexible base layer,

(b) a sparsely cross-linked linear diorganopolysiloxane layer overlying said base layer, and

(c) a photoadhesive layer overlying said diorganopolysiloxane layer, and in direct contact therewith comprising at least one photopolymerizable unsaturated compound having a boiling point above 100° C and a photoinitiator wherein at least one said photopolymerizable compound has at least one hydroxyl group and at least one acryloyl group or one methacryloyl group in the same molecule and the total concentration of the hydroxyl groups and the total concentration of the acryloyl or methacryloyl groups in the photoadhesive layer are each greater than 0.1 mmol/g.

14. A negative acting presensitized dry planographic printing plate comprising:

(a) a flexible base layer of polyethylene terephthalate,

(b) a halation prevention layer on said base layer and comprising a styrene-acrylic acid copolymer and a photoinitiator,

(c) a sparsely cross-linked linear diorganopolysiloxane layer overlying said styrene-acrylic acid copolymer layer,

(d) a photoadhesive layer overlying said diorganosiloxane layer consisting of a composition comprising

(1) an ethylacrylate-methylmethacrylate-acrylic acid copolymer,

(2) the addition product of 4 mols of glycidyl methacrylate with 1 mol xylylenediamine and ethyleneglycol diacrylate, said addition product containing hydroxyl groups and acryloyl or methacryloyl groups and

(3) a photoinitiator; the total concentration of the hydroxyl group and the total concentration of the acryloyl or methacryloyl groups in the photoadhesive layer each being greater than 0.1 mmol/g., and then,

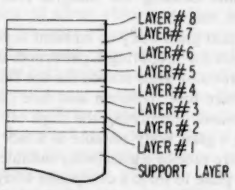
(e) a layer of diorganopolysiloxane capable of transmitting light having a wavelength from 300 to 400 mμ.

4,086,094

PHOTOGRAPHIC COUPLERS WITH N-HETEROCYCLIC DEVELOPMENT INHIBITING COUPLING-OFF GROUP

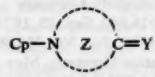
Keisuke Shiba; Takeshi Hirose; Kozo Inouye, and Akio Okumura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jun. 19, 1975, Ser. No. 588,556
Claims priority, application Japan, Jun. 20, 1974, 49-70669
Int. Cl.[2] G03C 1/40, 7/00, 5/54, 1/48
U.S. Cl. 96—100 R 6 Claims



1. In a light-sensitive silver halide photographic material

comprising a support and at least one silver halide emulsion layer the improvement which comprises at least one hydrophilic colloid layer which contains a color-forming coupler represented by the formula (I)



(I)

wherein Cp is a coupler moiety capable of coupling with an oxidation product of a color developing agent; Y is sulfur, selenium or tellurium; and Z is a nitrogen-containing moiety, which is incapable of exhibiting tautomerism prior to release from the coupler moiety and is released on coupling with the oxidation product of the color developing agent and a nitrogen atom of which is bonded to the coupling position of the Cp moiety, said nitrogen atom also being bonded to the C=Y moiety by a single bond.

4,086,095

COATING COMPOSITION

Gordon D. McLeod, Lenawee County, Mich., assignor to Mobile Oil Corporation, New York, N.Y.

and a continuation-in-part of Ser. No. 409,067, , and Ser. No. 284,099, , and Ser. No. 283,964, , and Ser. No. 107,578, , and Ser. No. 75,306, , said Ser. No. 409,067, and a continuation-in-part of Ser. No. 283,964, is a continuation-in-part of Ser. No. 107,578, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 75,306, Sep. 24, 1970, abandoned, said Ser. No. 284,099, is a continuation-in-part of Ser. No. 107,578, , and Ser. No. 75,306,.

This application Jan. 21, 1975, Ser. No. 542,837

Int. Cl.[2] C09D *5/10*

U.S. Cl. 106—1.17 **16 Claims**

1. A coating composition comprising:

metallic zinc in particulate form;

a chromate composition selected from strontium chromate, calcium chromate, barium chromate lead chromate plus lead sulfate and a mixture of zinc chromate and zinc oxide or zinc hydroxide;

a polyol silicate; and

a liquid organic vehicle,

said coating composition containing between about 4% and about 95% by weight of said metallic zinc, between about 1% and about 80% by weight of said chromate composition, and between about 1.5% and about 70% by weight of said polyol silicate, said weight percentages being based on the coating composition without said liquid organic vehicle,

said polyol silicate being a solvent-soluble, polyol silicate ester-exchange reaction product of:

(1) an organic silicate consisting essentially of ortho or poly silicates having ester-exchangeable groups of 1 to 6 carbon atoms selected from the group consisting of alkyl, hydroxyalkyl, alkoxyalkyl, and hydroxyalkoxyalkyl, siloxanes thereof, and their mixtures; and

(2) a polyol which is ester-exchangeable with (1),

said polyol being selected from the group consisting of an aliphatic polyol and a mixture of a major amount of said aliphatic polyol and a minor amount of polyvinyl butyral, and

said polyol silicate reaction product being made by reacting (1) and (2) in amounts providing a ratio of about 0.15 to about 1.8 moles of hydroxyl groups of (2) per mole of ester-exchangeable group of (1).

4,086,096

COATING COMPOSITION

Gordon D. McLeod, Lenawee County, Mich., assignor to Mobile Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 542,837, Jan. 21, 1975, and Ser. No. 409,067, , and Ser. No. 284,099, , and Ser. No. 283,964, , and Ser. No. 107,578, , and Ser. No. 75,306, , said Ser. No. 409,067, is a continuation-in-part of Ser. No. 283,964, Aug. 28, 1972, Pat. No. 3,917,648, which is a continuation-in-part of Ser. No. 107,578, Jan. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 75,306, Sep. 24, 1970, abandoned, said Ser. No. 284,099, is a continuation-in-part of Ser. No. 107,578, , and Ser. No. 75,306,. This application Mar. 19, 1975, Ser. No. 559,750

Int. Cl.[2] C09D *5/10*

U.S. Cl. 106—1.17 **16 Claims**

1. A coating composition comprising:

metallic zinc in particulate form;

a corrosion inhibitive composition selected from the group consisting of a mixture of strontium chromate and zinc chloride, a mixture of strontium chromate, zinc chloride, and chromium oxide green; barium metaborate, zinc phosphate, calcium borosilicate, and a mixture of calcium carbonate and red lead;

a polyol silicate; and

a liquid organic vehicle, said coating composition containing between about 4 and about 95% by weight of said metallic zinc, between about 1% and about 80% by weight of said corrosion inhibitive composition and between about 1.5% and about 70% by weight of said polyol silicate, said weight percentages being based on the coating composition without said liquid organic vehicle,

said polyol silicate being a solvent-soluble, polyol silicate ester-exchange reaction product of:

(1) an organic silicate consisting essentially of ortho or poly silicates having ester-exchangeable groups of 1 to 6 carbon atoms selected from the group consisting of alkyl, hydroxyalkyl, alkoxyalkyl, and hydroxyalkoxyalkyl, siloxanes thereof, and their mixtures; and

(2) a polyol which is ester-exchangeable with (1), said polyol being selected from the group consisting of an aliphatic polyol and a mixture of a major amount of said aliphatic polyol and a minor amount of polyvinyl butyral, and said polyol silicate reaction product being made by reacting (1) and (2) in amounts providing about 0.15 to about 1.8 moles of hydroxyl groups of (2) per mole of ester exchangeable group of (1).

4,086,097

METHOD OF PREPARING INSULATING REFRACTORY PRODUCTS AND THE PRODUCT THEREOF

Henri Carbonnel, Antony, France, assignor to Groupement pour les Activites Atomiques et Avancees "GAAA" S.A., Le Plessis Robinson, France

Filed Dec. 24, 1975, Ser. No. 644,009

Claims priority, application France, Jan. 15, 1975, 75 01178; Nov. 21, 1975, 75 35690

Int. Cl.[2] C04B *7/32*

U.S. Cl. 106—64 **2 Claims**

1. Method for preparing an insulating isotropic refractory product resistant to thermal shock and resistant to the corrosive action of molten metal, having high porosity, having a high coefficient of thermal conductivity of the order of 0.1 K cal/m/° C/hour, a Young's modulus of the order of 20,000 kg/squ. cm, a high tensile strength of the order of 12 kg/squ. cm, constituted by refractory fibers dispersed in a cement, characterized in that said product is produced by the following sequential process operations:

dry dispersing a mixture consiting of calcium aluminate cement mix and refractory fibers composed of less than 15% silica content, the percentage of fibers in relation to the total weight of the dry mixture being at least equal to 60%,

forming concrete by adding water to the dry mixture and placing in a mold,

stripping the concrete from the mold after the beginning of the setting,

drying the concrete outside the mold at a temperature increase of 10° per hour up to 300° C with a prolonged heat stage of several hours at 100° and 300° C,

increasing the temperature of drying with the same 10° C per hour rate from 300° to 800° C, and

baking the concrete at 800° C in air to form a chemical bonding between the refractory fibers and the calcium aluminate of the cement.

2. Insulating isotropic refractory product having high porosity according to claim 1.

4,086,098

COMPOSITION OF MATTER COMPRISING CELLULAR AGGREGATE DISTRIBUTED IN A BINDER

Daniel Le Ruyet, Plaisir, France, and Daniel De Vos, Charleroi, Belgium, assignors to BFG Glassgroup, Paris, France

Filed Nov. 10, 1976, Ser. No. 740,675

Claims priority, application United Kingdom, Nov. 14, 1975, 47111/75; Sep. 24, 1976, 47111/76

Int. Cl.² C04B 7/02

U.S. Cl. 106—97 **32 Claims**

1. A composition of matter comprising a cellular aggregate distributed in a hardenable or hardened binder or matrix material, characterised in that the aggregate comprises (1) a fine fraction of cellular glass beads of mesh sizes up to 3 mm, individually containing one or more interior cells with a maximum cross-sectional dimension at least 0.3 times the mesh size of the bead and having a non-cellular or micro-cellular surface skin, and (2) a fraction of coarse cellular glass beads of mesh sizes above 3 mm, individually having a multicellular core with a cell population per unit volume substantially higher than the population of said interior cells in said fine fraction beads and likewise having a non-cellular or micro-cellular surface skin, the ratio between the bulk volumes of the coarse fraction beads and the fine fraction beads being between 6:1 and 1:1, the volume of the combined fine and coarse fractions of beads being at least 50% of the dry volume of the composition.

4,086,099

METHOD OF PREPARING PLASTER

François Prudhon, Saint-Auban; Jean Fantino, Condrieu, and François Mounier, Champagne Au Mont D'Or, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Jun. 30, 1975, Ser. No. 591,333

Claims priority, application France, Jun. 28, 1974, 74 22621

Int. Cl.² C04B 11/00

U.S. Cl. 106—109 **9 Claims**

1. A process for preparing a plaster from gypsum comprising continuously flowing a fluid stream containing the gypsum in particulate or paste form axially through a cylindrical chamber for issuance as a linear stream therefrom into a vessel, continuously introducing a gaseous stream at elevated temperature into said chamber for continuous symmetrical flow in helical paths therethrough deflecting the helical paths of the gaseous stream into the linear stream issuing from the chamber to engage the linear stream which becomes entrained for continued travel as separated particles with the gaseous stream for removal of liquid and reaction to convert the gypsum component to plaster, and controlling the temperature of the hot gases for reaction at a temperature within the range of 160–190° C whereby a plaster is produced which is high in semi-hydrate content.

4,086,100

RUTILE-CONTAINING LUSTROUS PIGMENTS

Reiner Esselborn, and Horst Bernhard, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Continuation of Ser. No. 616,843, Sep. 25, 1975. This application Dec. 27, 1976, Ser. No. 754,698

Claims priority, application Germany, May 22, 1975, 2522572

Int. Cl.² C09C 3/06, 1/36

U.S. Cl. 106—291 **16 Claims**

1. In a lustrous mica flake pigment wherein the mica flakes are coated with a plurality of metal oxide layers consisting essentially of alternating layers of TiO_2 and SnO_2 in which each rutile layer is roentogenographically free from the anatase form, the improvement wherein the metal oxide layers comprise the sequence rutile/SnO_2/rutile and the innermost layer is rutile and wherein the thickness of the innermost rutile layer is a maximum of about 25 nm.

4,086,101

PHOTOVOLTAIC CELLS

John Francis Jordan, and Curtis Magill Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Continuation-in-part of Ser. No. 508,570, Sep. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,705, Jan. 8, 1974, Pat. No. 3,880,633. This application Nov. 14, 1975, Ser. No. 631,815

Int. Cl.² H01M 1/00; B05D 5/12

U.S. Cl. 136—89 CD **56 Claims**

1. A method of making a photovoltaic cell of the type having an insulating substrate, a first conductive layer, a second layer comprised of CdS, and a third layer forming a heterojunction with said second layer, comprising the step of forming at least a portion of said CdS layer with a composition comprising a cadmium salt, a sulphur containing compound, and an aluminum containing compound, the aluminum content of the composition being at least 10 molar percent of the total metal content of the composition.

4,086,102

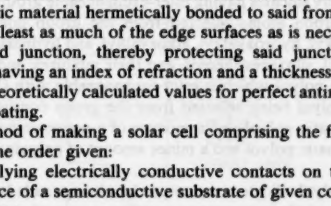
INEXPENSIVE SOLAR CELL AND METHOD THEREFOR

William J. King, 9 Putnam Rd., Reading, Mass. 01867

Filed Dec. 13, 1976, Ser. No. 749,776

Int. Cl.² H01L 31/06, 7/00

U.S. Cl. 136—89 CC **16 Claims**



1. A solar cell comprising a semi-conductor device including a rectifying junction and having a front surface, electrically conductive members in contact with said surface, and a layer of hermetic material hermetically bonded to said front surface and to at least as much of the edge surfaces as is necessary to cover said junction, thereby protecting said junction, said material having an index of refraction and a thickness approximating theoretically calculated values for perfect antireflective [(AR)] coating.

5. Method of making a solar cell comprising the following steps in the order given:

(a) applying electrically conductive contacts on the front surface of a semiconductive substrate of given conductivity type;

(b) putting down in hermetic form upon said surface a thin layer of combined antireflective and protective material,

said layer having an index of refraction and thickness approximating theoretically calculated values for perfect antireflective coating;

(c) implanting ions of an impurity element of opposite conductivity type through said layer and into said surface of the substrate so as to produce a P-N junction therein;

(d) heating the substrate with its contacts at least to a temperature high enough so that radiation damage due to step (c) is substantially annealed and said contacts alloy with the substrate.

15. Method of making contacts to a semiconductor junction comprising applying masked aluminum upon one surface of an N-type substrate, implanting P-forming ions into said surface, putting down in hermetic form upon said surface a thin layer of Al_2O_3, and heat treating, the assembly.

16. Method of making a solar cell comprising applying conductive contacts on one surface of an *n*-type silicon substrate, coating said surface with a film of aluminum sufficiently thin to permit adequate light penetration, putting down in hermetic form upon said coating a thin layer of Al_2O_3, and heat treating the total structure at a temperature high enough to alloy said aluminum into said silicon substrate.

4,086,103
ACCELERATOR FOR PHOSPHATING SOLUTIONS

Kevin James Woods, 66 Heathmont Road, Heathmont, Victoria, Australia

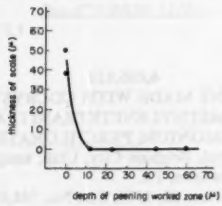
Filed Aug. 3, 1976, Ser. No. 711,232
Claims priority, application Australia, Aug. 13, 1975, PC2786
Int. Cl.² C23F 7/08
U.S. Cl. 148—6.15 R **6 Claims**

1. A method for accelerating the formation of a zinc or manganese phosphate coating on a metal substrate, which method comprises dissolving gaseous nitrogen peroxide in an acidic zinc or manganese phosphate coating solution and contacting the metal substrate with the solution so produced.

4,086,104
METHOD OF PREVENTING OXIDATION OF AUSTENITIC STAINLESS STEEL MATERIAL IN HIGH TEMPERATURE STEAM

Kazuhisa Kinoshita, Yokohama, and Naoki Masamune, Kawasaki, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 9, 1976, Ser. No. 704,105
Claims priority, application Japan, Jul. 14, 1975, 50-85261
Int. Cl.² C21D 7/06
U.S. Cl. 148—12 E **6 Claims**

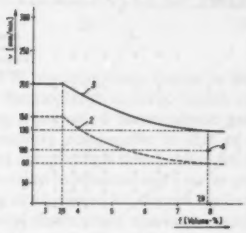


1. A method of preventing scale formation by surface oxidation of stabilized austenitic stainless steel material in high temperature dry steam, comprising subjecting the surface of a stabilized austenitic stainless steel material which will be contacted with high temperature dry steam to shot peening after the final heat treatment operation in the manufacturing process of said material or after the hot rolling of said material when said final heat treatment operation is eliminated by a hot finishing operation, the now, shot-peened stabilized austentitic stainless steel being usable in an atmosphere of high temperature dry steam and being substantially free from formation of scale.

4,086,105
METHOD OF PRODUCING FINE-GRAIN SHEET OR FINE-GRAIN PLATE OF AUSTENITIC STEELS

Max Mayrhofer, and Walter Taschner, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft, Vienna, Austria

Filed Feb. 1, 1977, Ser. No. 764,552
Claims priority, application Austria, Feb. 18, 1976, 1141/76
Int. Cl.² C21D 7/13
U.S. Cl. 148—12 R **8 Claims**

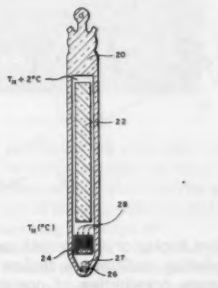


1. In a method of producing fine-grain sheet or fine-grain plate of austenitic steels, in particular fine-grain plate having a thickness exceeding 50 mm, by hot rolling rolling stock in a number of passes, the improvement which is characterised in that the mean velocity of the reduction in thickness (v in mm/min) achieved in a plurality of subsequent passes in dependence upon the ferrite content (f in %) of the steels, is chosen in a manner that up to a ferrite content of 3.5% the mean velocity of the reduction in thickness is more than 150 mm/min and at a ferrite content of more than 3.5% the mean velocity of the reduction in thickness is above a value given by the relationship $v = 3.8f^2 - 60f + 315$, the deformation carried out in this manner amounting to at least 30%.

4,086,106
HALOGEN-DOPED HG,CD,TE

Eric Shanks Johnson, and Joseph Lawrence Schmit, both of Minnetonka, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 6, 1977, Ser. No. 757,271
Int. Cl.² H01L 31/00
U.S. Cl. 148—33 **16 Claims**



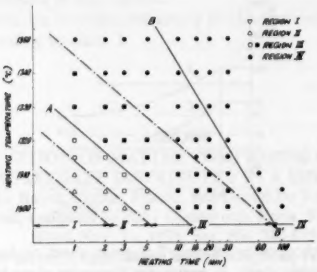
1. Mercury cadmium telluride having a quantity of a material comprising a halogen dispersed therein.

4,086,107

HEAT TREATMENT PROCESS OF HIGH-CARBON CHROMIUM-NICKEL HEAT-RESISTANT STAINLESS STEELS

Mitsuru Tanino, Tokyo; Hajime Komatsu, Kawasaki, and Susumu Takemura, Hikari, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 578,268, May 16, 1975, abandoned. This application Feb. 2, 1977, Ser. No. 764,846
Claims priority, application Japan, May 22, 1974, 49-56634
Int. Cl.[2] C21D *4/00*
U.S. Cl. 148—136 **2 Claims**



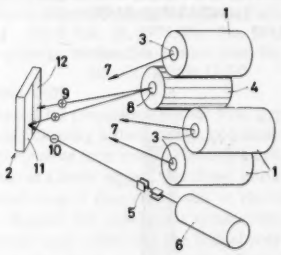
1. A heat treatment process for high-carbon chromium-nickel heat-resistant stainless steels to improve the creep rupture strength in a temperature range over about 800° C particularly at 1000° C, which comprises heating high-carbon chromium-nickel heat-resistant stainless steels consisting essentially of 0.2 - 1.5% C, 15 - 40% Cr, 10 - 50% Ni, Si not more than 5%, Mn not more than 15%, and the remainder being Fe and impurities for 1 to 60 minutes in a temperature range from 1300° C to 1350° C and then quenching the said steel at cooling rates higher than 200° C/min. in order to produce the eutectic carbide structure consisted of the matrix metal and carbide phase in which M_7C_3-type carbide is contained not less than 25% by weight of the total weight of carbides, that are present in the said eutectic carbide structure, at grain boundary triple points, along grain boundaries, and within grains.

4,086,108

SELECTIVE DOPING CRYSTAL GROWTH METHOD

Shunichi Gonda, Higashi-Murayama, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 28, 1977, Ser. No. 781,889
Claims priority, application Japan, Jun. 24, 1976, 51-73868
Int. Cl.[2] H01L *21/203, 21/363*
U.S. Cl. 148—175 **2 Claims**



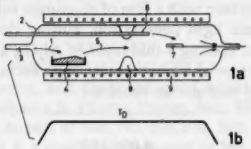
1. A selective doping crystal growth method comprising the steps of irradiating uniformly a surface of a substrate with molecular beams constituting of constituent elements of a crystal and ion beams constituting of atoms and/or molecules as dopant and simultaneously irradiating specific regions of said surface where the doping is unnecessary with electron beams to neutralize said ion beam directed to said regions with said electron beam.

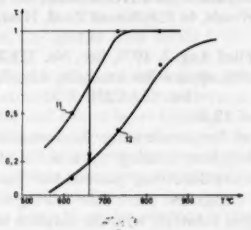
4,086,109

METHOD FOR THE EPITAXIAL GROWTH OF III-V COMPOUNDS AT HOMOGENEOUS LOW TEMPERATURE UTILIZING A SINGLE FLAT TEMPERATURE ZONE

Jean-Philippe Hallais, Ablon sur Seine, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 4, 1977, Ser. No. 774,524
Claims priority, application France, Mar. 10, 1976, 76 06832
Int. Cl.[2] H01L *21/205, 29/20*
U.S. Cl. 148—175 **7 Claims**





1. A method for the epitaxial deposition of an AIII-BV compound on a monocrystalline substrate from the vapor phase comprising: in a single flat temperature zone, forming as a first gaseous phase a hydrogen free mixture of a halide of a BV element and a neutral gas, reacting said first gaseous phase with an AIII element in the liquid phase so as to form a second gaseous phase, said first and second gaseous phases being formed remote from said substrate, and then mixing said second gaseous phase with hydrogen in the immediate vicinity of said substrate to thereby deposit and epitaxial layer of said AIII-BV compound on said substrate.

4,086,110

PROPELLANT MADE WITH COCRYSTALS OF CYCLOTETRAMETHYLENETETRANITRAMINE AND AMMONIUM PERCHLORATE

Michael L. Levinthal, Brigham City, Utah, assignor to Thiokol Corporation, Newtown, Pa.

Filed Nov. 22, 1976, Ser. No. 744,075
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.4 **2 Claims**

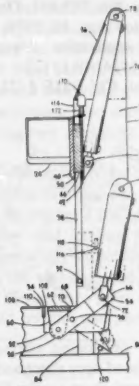
1. A solid propellant for rockets, comprising the following, cured composition in parts by weight:

Cocrystals of cyclotetramethylenetetranitramine and ammonium perchlorate	40 - 80 parts
Aluminum powder	4 - 24 parts
Organic elastomer selected from polyurethane, carboxyl-terminated polybutadiene, and isophorone diisocyanate (molecular weights of about 500 - 6,000)	15 - 40 parts.

4,086,111
WOOD SPLITTER

Max L. Corey, P.O. Box 384, Silverdale, Wash. 98383

Filed Sep. 13, 1976, Ser. No. 722,383
Int. Cl.[2] B27L 7/00
U.S. Cl. 144—193 A 18 Claims

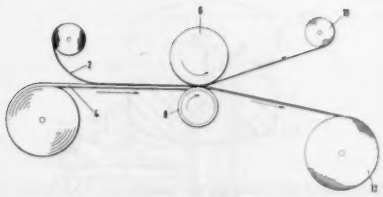


1. A wood splitter comprising:
a. a column having a first and second end;
b. a blade slidably attached to the column having its edge directed toward the second end of the column;
c. a pusher member attached to the second end of the column having a portion thereof movable along the column toward the blade edge;
d. means for moving the blade directly toward the pusher to contact one end of a piece of wood placed between the blade and the pusher while the opposite end of the piece of wood contacts the pusher member; and
e. means for forcefully moving the pusher member so that the portion that moves toward the blade causes the wood to move against the blade and split.

4,086,112
METHOD OF PRINTING FABRICS

Kenneth Porter, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England

Filed May 17, 1976, Ser. No. 687,325
Claims priority, application United Kingdom, Jan. 20, 1976, 2172/76; Jan. 26, 1976, 2887/76
Int. Cl.[2] B32B 31/20
U.S. Cl. 156—73.1 7 Claims



1. A method of simultaneously dyeing and bonding a fabric comprising thermoplastic fibres, wherein a transfer sheet supporting an ink comprising a heat transferable dyestuff is contacted with said fabric, and the sheet and fabric are subjected to heat and pressure in spaced discrete areas such that the fabric becomes thermally bonded and the dyestuff is transferred from the transfer sheet to the fabric at least in areas corresponding to said discrete areas.

4,086,113
METHOD AND MEANS FOR REPAIRING DAMAGED VINYL SHEETS

Herman R. Cataffo, 21 St. James Pl., Brooklyn, N.Y. 11205, and Anthony J. De Meo, 2072 E. 17th St., Brooklyn, N.Y. 11229

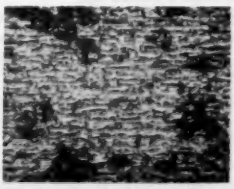
Filed Aug. 11, 1976, Ser. No. 713,341
Int. Cl.[2] B32B 35/00
U.S. Cl. 156—98 6 Claims

1. The method of repairing tears, burns, or like damage in vinyl or similar thermoplastic material which comprises the steps of providing a pre-cured thermoplastic patch having a heat softening property comparable to that of the material being repaired and comprising a stem portion for insertion into a void in the material to be repaired and a cover portion having a layer of backing cloth embedded therein for overlapping the undamaged material surrounding the void, excising the damaged area of the material to be repaired to provide a void having a cross sectional area corresponding to the cross sectional area of the stem portion of the pre-cured thermoplastic patch but less than that of said cover portion and the layer of backing cloth embedded therein, inserting the stem portion of the patch into the void provided in the material under repair with the cover portion of the patch and the layer of backing cloth embedded therein overlapping the undamaged material surrounding the void, and applying heat to the cover portion of the patch and the material being repaired to fuse the cover portion and the embedded layer of backing cloth into the material being repaired.

4,086,114
ALUMINUM SURFACE TREATMENT TO ENHANCE ADHESION IN A GIVEN DIRECTION

Kenneth N. Karol, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 580,642, May 27, 1975, abandoned, which is a continuation of Ser. No. 463,639, Apr. 24, 1974, abandoned, which is a division of Ser. No. 349,137, Apr. 9, 1973, Pat. No. 3,838,506. This application Jan. 21, 1977, Ser. No. 761,025
Int. Cl.[2] B32B 31/00
U.S. Cl. 156—153 3 Claims



1. In a method of laminating an aluminum member to an electrically insulative substrate member, an improved method of preparing the aluminum surface which is to be bonded to the substrate surface in order to enhance adhesion and resist peel in a given direction, comprising the steps of:
subjecting said aluminum surface to a texturing treatment, with mechanical means, to form a substantially continuous pattern of oblong depressions in said surface, said oblong depressions having substantially vertical sides, with a depth in the range of .0001 to .0002 inch, for creating shear forces which are being opposite to forces tending to cause

peel and having major axes positioned in general alignment with said given direction of enhanced adhesion;
cleaning said texturized surface so as to remove all impurities, including aluminum oxide; and
covering said textured surface with a continuous coating of clear, unsealed anodize.

4,086,115

METHOD OF MAKING A HOCKEY STICK

Robert D. Sweet, Jr., 933 S. Juliana, Bedford, Pa. 15522, and Peter J. Monaghan, 1900 Hiller Rd., West Bloomfield, Mich. 48033

Filed Oct. 16, 1975, Ser. No. 622,877
Int. Cl.[2] A63B *59/00*
U.S. Cl. 156—178 **1 Claim**

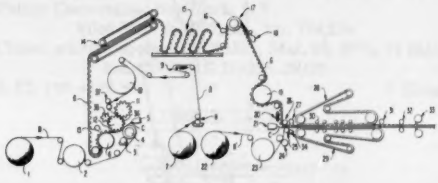
1. A method of constructing a hockey stick comprising:
assembling four continuous fiberglass strips in such a manner as to form a rectangular cross sectionally shaped continuous hollow member defined by longitudinally extending opposing end walls and sidewalls;
placing two spaced bundles of rovings along each sidewall of said rectangular shape and one bundle of rovings along each end wall of said rectangular shape;
continuously pulling said fiberglass strips and said bundles of rovings through a heated die;
pressure impregnating said fiberglass strips and said rovings with a resin while said rovings and said fiberglass strips are being pulled through said heated die so as to form a hollow elongated member of even wall thickness;
severing shafts of predetermined length from said elongated member while continuing to pull said strips and bundles through said die;
forming a hockey stick blade with an integral rectangular shaped elongated tongue portion of a cross sectional size smaller than the interior cross section of said shaft;
providing an annular shoulder on said blade surrounding said tongue having a width equal to the width of the wall thickness of said shaft so as to blend smoothly therewith;
providing recesses on opposite sides of said blade adjacent said tongue portion, said recesses being defined in part by reinforcing flange portions which act to reinforce said blade and by a portion of said annular shoulder;
applying a layer of epoxy to said shaft interior and to said tongue portion; and
inserting said tongue portion into one end of said hockey stick.

4,086,116

CORRUGATED CARDBOARD SHEET AND METHOD FOR PRODUCING SAME

Takao Yazaki, and Kazuhide Hattori, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 519,311, Oct. 30, 1974, abandoned. This application Aug. 10, 1976, Ser. No. 713,172
Claims priority, application Japan, Oct. 30, 1973, 48-125027[U]; Jan. 30, 1974, 49-11773
Int. Cl.[2] B31F *1/22, 1/24*
U.S. Cl. 156—205 **23 Claims**



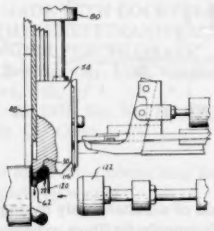
1. A method for producing corrugated cardboard sheets comprising a corrugated core sheet and a liner sheet wherein at least either of the core sheet or the liner sheet is constructed from paper, said method comprising
feeding and shaping a core sheet into the desired corrugated configuration,
extruding a continuous film of a molten thermoplastic polymer,
feeding the extruded continuous film of molten thermoplastic polymer through free space at a rate which is substantially equal to the production rate of the shaped core sheet,
applying as the adhesive said film of extruded continuous molten thermoplastic polymer to at least one side of the shaped core sheet as said shaped core sheet is fed, and
substantially simultaneously pressing in a bonding zone a liner sheet to said adhesive applied side of the shaped core sheet as said shaped core sheet is fed to bond said liner sheet and said core sheet by the interposition of said film of the molten thermoplastic polymer to form a corrugated sheet assembly.

4,086,117

TAPING MACHINE

Harold I. Pearsall, Centerville, Ohio, assignor to The Globe Tool and Engineering Company, Dayton, Ohio

Continuation of Ser. No. 638,435, Dec. 8, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,873
Int. Cl.[2] B31F *1/00*
U.S. Cl. 156—212 **20 Claims**



1. In an apparatus for wrapping tape about an article:
a tool member having an aperture;
a first clamping member comprising marginal portions of said aperture;
a tape press member slidably mounted on said tool member;

a second clamping member extended from said tape press member into said aperture;

means for moving said tool member and said tape press member to receive between said first and second clamping members a leading end portion of the tape from a direction extended along a first side of the article, to receive between said first and second clamping members a trailing end portion of the tape from a direction extended along a second side of the article, said second side being generally oppositely directed from said first side, and to press said leading end portion and said trailing end portion together.

11. In a method for wrapping tape about an article utilizing a taping apparatus having two clamping members and a tape ram:

advancing a leading end portion of the tape along one side of the article to a position between the clamping members;

moving the tape ram to engage a trailing end portion of the tape and to advance said trailing end portion along a second generally oppositely directed side of the article to a position between the clamping members; and

moving the clamping members to press together said leading end portion and said trailing end portion.

4,086,118

RIGID COMPOSITE ARTICLES AND A METHOD FOR THEIR MANUFACTURE

Frank Dewey, 1020 Market St., St. Joseph, Mich. 64505

Filed Oct. 4, 1976, Ser. No. 729,395

Int. Cl.² B32B *33/00, 27/40, 27/38, 13/02*

U.S. Cl. 156—246 **5 Claims**

1. A method for forming a rigid composite article comprising an outer impression-retaining thin surface layer and a relatively thick backing layer comprising (a) providing a master having coated on the surfaces therof a mold release material, (b) coating the surfaces of the master with a catalyzed liquid urethane resin. (c) curing said urethane resin to form a rigid surface layer having a thickness of from about 0.0675 inch to about 0.25 inch and a Shore durometer hardness of from about 65D to about 90D, (d) placing on the back surface of said rigid surface layer a relatively thick backing layer of a curable material, (e) curing said backing layer, and (f) recovering the rigid composite article so produced.

4,086,119

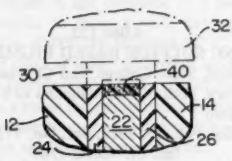
METHOD OF MAKING A BATTERY SEPARATOR

Camillo M. Vecchiotti, Ridgewood, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Sep. 24, 1976, Ser. No. 726,264

Int. Cl.² B29C *19/04;* **B32B** *31/00*

U.S. Cl. 156—273 **7 Claims**



1. A method of manufacturing a sleeve-like battery separator comprising the following steps:

placing two sheets of microporous plastic material in a spaced parallel relationship about a platen having first and second opposed sides and a transverse edge extending between said opposed sides,

maintaining said sheets of microporous plastic material in contact with the first and second opposed sides of said platen respectively such that corresponding side edges of said plastic sheets mutually extend beyond the transverse edge of said platen and define a pair of inner facing surfaces extending beyond said transverse edge of said platen,

disposing a strip of plastic material onto said transverse edge of said platen between said inner facing surfaces of said plastic sheets in such a manner that said strip extends beyond the corresponding side edges of said plastic sheets,

applying pressure to said strip of plastic material and to said plastic sheets to cause said strip of plastic material to be flush with said corresponding side edges of said plastic sheets,

adhering the side edge portions of said plastic strip to each one of said pair of inner facing surfaces, respectively, thus to form said sleeve-like battery separator.

4,086,120

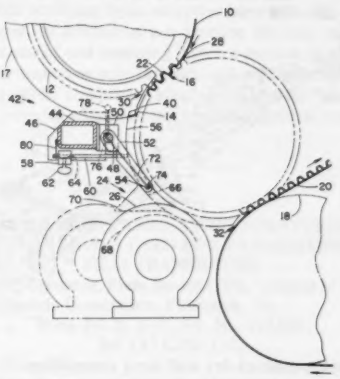
WEB GUIDES FOR CORRUGATOR MACHINES

James L. Cosby, Parkville, and Gordon L. Morgret, Baltimore, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 596,407, Jul. 16, 1975. This application May 19, 1976, Ser. No. 687,906

Int. Cl.² B31F *1/00*

U.S. Cl. 156—473 **6 Claims**



1. An improved self-adjusting web guide structure for a corrugated web single-facer machine of the type including: cooperating upper and lower corrugator rolls between which a paper medium web is passed to form corrugations therein; adhesive roll means, movable toward and away from said lower corrugator roll, for applying adhesive to the flute tips of said corrugations as said web passes around said lower corrugator roll; and a pressure roll means for pressing a liner web against said flute tips having adhesive thereon, the improvement comprising:

a plurality of laterally-spaced guide means for continuously urging a corrugated portion of said medium web against said lower corrugator roll as said portion advances thereabout to pass between said lower corrugator roll and said pressure roll means,

a support means rigidly secured to said single-facer machine, said support means including a support shaft extending along the length of said support means,

an articulated means comprising a plurality of connecting links pivotally supported on said support shaft and pivotally connected to each of said guide means for providing exact alignment of an arcuate portion of said guide means with said lower corrugator roll and permitting substantially unrestricted movement of said guide means toward and away from aid lower corrugator roll,

biasing means connected to each of said articulated means for urging said guide means against said corrugated portion at a preselected pressure, said biasing means being yieldable to compensate for irregularities in said corru-

gated portion of said web to provide self-adjustment of said web guide structure, and

an adhesive applicator roll having a plurality of laterally spaced circumferential grooves in alignment with said guide means for receiving a portion of said guide means therein to enable said guide means to extend partially around said lower corrugator roll between it and said applicator roll when the latter roll is in adhesive applying engagement with said corrugated portion of said web, said guide means each include a trailing guide portion adapted to remain in said grooves when said applicator roll is moved to an inactive position out of engagement with said lower corrugator roll.

4,086,121

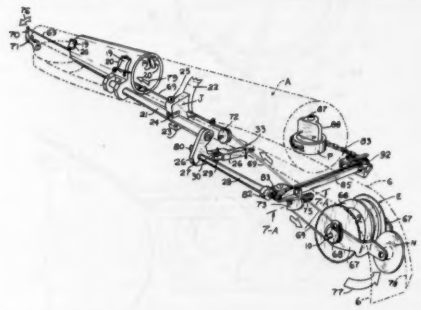
SELF-CONTAINED DRY WALL TAPER

Robert G. Ames, 2150 Forest View, Hillsborough, Calif. 94810

Filed Apr. 26, 1977, Ser. No. 791,068

Int. Cl.[2] B32B *31/00*; B44C *7/02*

U.S. Cl. 156—526 **4 Claims**



1. A self-contained dry wall taper comprising:

(a) a hollow elongated body containing mastic and having a nozzle at its foward end for delivering a layer of mastic onto a tape;

(b) tape feeding means for delivering tape adjacent to said nozzle for receiving a layer of mastic therefrom including:

(c) a sleeve slidable on said body from a neutral position thereon;

(d) a tape guide extending along said body;

(e) an arm operatively connected to said sleeve and rockably supporting a shaft;

(f) a track paralleling the line of movement of said sleeve on said body, said shaft having a radially extending flexible tip movable into contact with said track by said sleeve and being flexed by said track and travelling therealong as the sleeve is moved in the same direction, the flexing of the tip rocking said shaft about its axis;

(g) a tape penetrating pin extending radially from said shaft and underlying said tape guide, said pin being angularly disposed with respect to said tip so that when the tip is flexed by coming into contact with the track and causes said shaft to rock about its axis, said pin will be swung to penetrate the tape; and

(h) whereby further movement of the sleeve and arm in the same direction will cause said pin to advance the tape along the guide and a return movement of the sleeve and arm will cause the tip to reverse its movement along said track and be flexed in the opposite direction and rock said shaft to disengage the pin from the tape so that the pin will ride clear of the tape on its return movement.

4,086,122

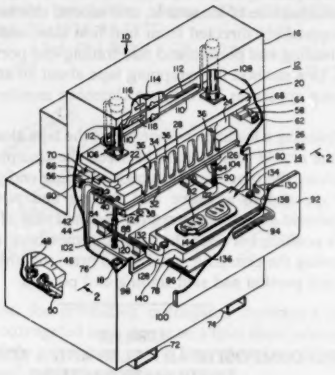
HYDROACOUSTIC WELDER

John V. Bouyoucos; Marvin J. Behnfeldt, and Roger L. Selsam, all of Rochester, N.Y., assignors to Hydroacoustics Inc., Rochester, N.Y.

Filed Dec. 17, 1976, Ser. No. 751,828

Int. Cl.[2] B06B *1/18*; B29C *27/08*

U.S. Cl. 156—556 **19 Claims**



1. Apparatus for vibratory welding of parts which comprises a platen upon which said parts are adapted to be disposed, a welding head, said platen and said welding head being movable with respect to each other to bring the interface of said parts into clamped relationship, said welding head comprising

(a) a seismic mass,

(b) at least one flexural member having substantial stiffness for vibratory motion, attached to said seismic mass,

(c) a first plate mounted by said flexural members to said mass for said vibratory movement with respect to said mass in the plane of said interface, said plate being disposed in engagement with one of said parts when said head and platen bring said parts into clamped relationship, and

(d) a hydroacoustic driver, mounted to said mass and having driven members slidably supported solely in said driver which driven members are coupled to said plate, for translating the flow of pressurized hydraulic fluid into high force vibratory motion of said driven member and said plate at a frequency which is approximately equal to the resonant frequency determined by the stiffness of said flexural member and the mass thereof and the mass of said plate and of the part in engagement therewith.

4,086,123

ZINC SULFIDE BASED PIGMENTS

Floyd A. Hummel, State College, and Charussri Sombuthawee, University Park, both of Pa., assignors to Ferro Corporation, Cleveland, Ohio

Filed Feb. 25, 1977, Ser. No. 772,287

Int. Cl.[2] C09C *1/04*

U.S. Cl. 106—293 **17 Claims**

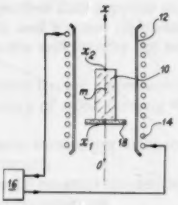
1. A pigment comprising a zinc sulfide host containing in solid solution at least a sufficient amount of a metal sulfide-containing dopant to alter the color of the zinc sulfide, said dopant being selected from the group consisting of lithium sulfide, calcium sulfide, gallium sulfide, lithium indium sulfide, lithium indium sulfide and copper indium sulfide, lithium indium sulfide and silver indium sulfide, lithium sulfide and chromium sulfide, indium sulfide and copper oxide, indium sulfide and lithium oxide, lithium sulfide and manganese sulfide and copper sulfide, and mixtures thereof.

4,086,124

METHOD OF POLARIZATION OF A FERROELECTRIC MATERIAL

Jean Claude Peuzin, Eybens, and Michel Tasson, Seyssinet Pariset, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed May 19, 1975, Ser. No. 578,678
Claims priority, application France, May 30, 1974, 74 18872
Int. Cl.[2] B01J 17/00
U.S. Cl. 156—603 2 Claims



1. A method of polarizing a ferroelectric material which exhibits a Curie point at a temperature T_c, without applying an electric field thereto, comprising:

bringing a solid body of said material to a temperature above the Curie point T_c but below the temperature of fusion;

establishing and maintaining a temperature gradient in said material along a linear dimension of said body without bringing any part of said material to the temperature of fusion;

suppressing said temperature gradient by equalizing the temperature of the heated material as preparation for and prior to transition back through the Curie point T_c, and;

bringing said material back to a temperature below the Curie point T_c.

4,086,125

WOOD LAMINATION METHOD UTILIZING EMULSIFIED PHENOL-FORMALDEHYDE RESINS

Ramesh C. Vasishth, Delta, and Pitchaiya Chandramouli, Richmond, both of Canada, assignors to Cor Tech Research Ltd., Richmond, Canada

Division of Ser. No. 567,881, Apr. 14, 1975, Pat. No. 4,017,437.
This application Dec. 27, 1976, Ser. No. 754,616
Claims priority, application United Kingdom, Apr. 17, 1974, 16860/74
Int. Cl.[2] B29J 5/00
U.S. Cl. 156—62.2 10 Claims

1. A method of forming a panel board, which comprises:

reacting formaldehyde and phenol at a mole ratio of formaldehyde to phenol greater than about 1.7:1 in an aqueous reaction medium in the presence of a metal carboxylate catalyst therefor to form a resin having a viscosity of about 1,000 to 40,000 cps at about 24° C,

adding to said resin at least one strong acid in a catalyzing amount for thermosetting said resin at elevated temperature to form a room temperature-stable acid-catalyzed and mobile thermosetting phenol-formaldehyde resin capable of rapid cure at elevated temperature,

emulsifying the latter resin to form a stable resin-in-water emulsion by dispersing the latter resin in water at a temperature below the curing temperature of the latter resin,

applying said emulsion to a plurality of panel board-forming elements to provide a substantially even distribution of resin over part of the surfaces of said elements,

assembling the coated elements,

heating said resin to above its curing temperature while maintaining said coated elements in said assembled condition to adhesively join said elements together by thermoset resins, and

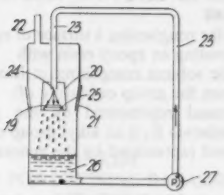
recovering a panel board.

4,086,126

PRODUCTION OF HIGH RADIANCE LIGHT EMITTING DIODES

Anthony John Springthorpe, Richmond, and Michael John Rider, Kanata, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed May 27, 1977, Ser. No. 801,106
Int. Cl.[2] H01L 21/306
U.S. Cl. 156—642 12 Claims



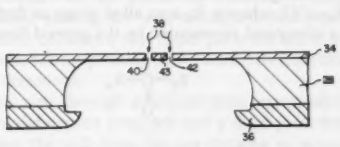
1. For a light emitting diode comprising a GaAs substrate and layers of differentially doped GaAlAs forming sequentially a first confining layer, an active layer and a second confining layer, to produce a p-n junction between said active layer and one of said confining layers, a method of selectively etching at least one hole through said substrate to said first confining layer, comprising ejecting an etchant based on an alkaline peroxide solution onto a masked surface of said substrate.

4,086,127

METHOD OF FABRICATING APERTURED DEPOSITION MASKS USED FOR FABRICATING THIN FILM TRANSISTORS

Michael W. Cresswell, Plum Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 1, 1977, Ser. No. 812,086
Int. Cl.[2] C23F 1/02
U.S. Cl. 156—643 4 Claims



1. A method of fabricating apertured deposition masks which are used in the fabrication of thin film deposited electronic components, wherein the apertured deposition mask has a plurality of closely spaced apertures therethrough with solid mask bridge portions between the spaced apertures, which bridge portion is of a predetermined dimension and wherein the apertured deposition mask comprises a core portion with a first metal layer provided on a relief side of the core, and a second metal layer provided on a defining side of the core which method comprises:

(a) selective photoresist delineation and etching of portions of the relief side metal layer and the core while leaving the defining side metal layer intact;

(b) directing a narrow width radiation beam upon closely spaced portions of the defining side metal layer, which portions are aligned over the etched portions of the core and the relief side metal layer, to selectively cut through the defining side metal layer providing the desired spaced apertures separated by the requisite bridge portion of defining side metal layer.

4,086,128
PROCESS FOR ROUGHENING SURFACE OF EPOXY RESIN

Akitoshi Sugio, Omiya; Yukiya Masuda, Urawa; Toshihiko Kobayashi, Showamachi; Koichi Nakano, and Tsukasa Sawai, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Mar. 2, 1977, Ser. No. 773,437

Claims priority, application Japan, Mar. 4, 1976, 51-23599; Apr. 9, 1976, 51-40052

Int. Cl.[2] B29C *17/08;* **C09K** *13/04*

U.S. Cl. 156—668 **28 Claims**

1. A process for roughening a surface of epoxy resin, which comprises pretreating an epoxy resin with

(1) an organic solvent comprising at least one compound selected from the group consisting of:

(a) a compound represented by the general formula, R_1—OH, wherein R_1 is an alkyl group or furfuryl group,

(b) a compound represented by the general formula,

$$R_2—\overset{\overset{O}{\|}}{C}—R_3,$$

wherein R_2 is a hydrogen atom, or an alkyl group, R_3 is an alkyl group, an alkoxyl group, or a hydroxyl group, and when R_2 is a hydrogen atom, R_3 is an alkoxyl group or a hydroxyl group, and

(c) a compound represented by the general formula, CH_3—X, wherein X is a nitrile group, or a nitro group, or

(2) an organic solvent comprising:

(a) a compound represented by the general formula, R_1—OH, wherein R_1 has the same meaning as defined above, and

(d) at least one compound selected from the group consisting of formamide and a polyhydric alcohol as a pretreating solution, and then etching the resulting pretreated epoxy resin with an etching solution containing hydrogen peroxide and sulfuric acid.

16. A process for roughening a surface of epoxy resin, which comprises pretreating an epoxy resin with an organic solvent comprising at least one compound selected from the group consisting of:

(a) a compound represented by the general formula, R_1—OH, wherein R_1 is an alkyl group or furfuryl group,

(b) a compound represented by the general formula,

$$R_2—\overset{\overset{O}{\|}}{C}—R_3,$$

wherein R_2 is a hydrogen atom, or an alkyl group, R_3 is an alkyl group, an alkoxyl group, or a hydroxyl group, and when R_2 is a hydrogen atom, R_3 is an alkoxyl group or a hydroxyl group, and

(c) a compound represented by the general formula, CH_3—X, wherein X is a nitrile group, or a nitro group as a pretreating solution, and then etching the resulting pretreated epoxy resin with an etching solution containing a persulfate and sulfuric acid.

4,086,129
PROCESS FOR CONTROLLING THE INTRINSIC VISCOSITY OF SULFITE PULP

Romeo John Conca; John Patrick Gray, both of Shelton, and Tod Hunter Sloan, Tumwater, all of Wash., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,328

Int. Cl.[2] G01N *21/20;* **D21C** *3/22, 7/12*

U.S. Cl. 162—49 **4 Claims**

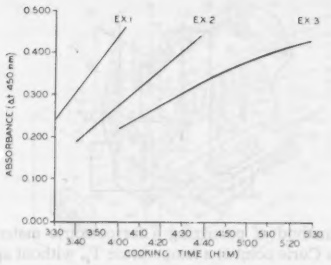
1. A process for the preparation of sulfite pulp of a given controlled intrinsic viscosity comprising

predetermining the rate of change in light absorbance in digestion cooking liquor required to obtain a given pulp intrinsic viscosity for a range of initial weight ratios of combined SO_2 to wood,

digesting particulate wood in the presence of sulfite cooking liquor,

measuring the rate of change in light absorbance in the cooking liquor as the digestion proceeds

comparing the thus measured rate of change of light absorbance with the predetermined rate of change of light absorbance for the given pulp intrinsic viscosity,



determining from said comparison the initial weight ratio of combined SO_2 to wood,

adjusting the time, temperature and pressure of the digestion operation to obtain the given controlled intrinsic viscosity at the aforesaid initial weight ratio of combined SO_2 to wood, and

terminating the digestion operation in accordance with the adjusted time, temperature and pressure.

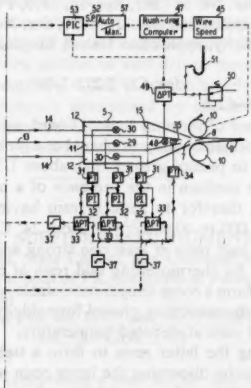
4,086,130
CONTROL SYSTEM AND METHOD FOR A MULTI-CHANNEL PAPER MACHINE DISTRIBUTOR

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 16, 1976, Ser. No. 705,828

Int. Cl.[2] D21F *1/06, 11/04*

U.S. Cl. 162—123 **14 Claims**



13. A control system in a multi-channel paper machine distributor of the type having therein a plurality of channels to which fibrous paper stocks are respectively supplied from different respective sources through separate ducts supplying the paper stocks to upstreams ends of the channels, and a perforated partition within the distributor spaced from said

upstream ends and through which the paper stocks pass from upstream portions of the channels into downstream portions of the channels which converge toward a slice opening which delivers the stocks from the plurality of channels in multi-ply relation to travelling forming means of a papermaking machine, and wherein there is a velocity differential between the stock flowing through the channels upstream from said partition in comparison with the stock flowing through said downstream portions of the channels comprising:

each of said ducts having a respective pump for driving the stock under controlled velocity into the channel into which the respective duct supplies stock, and each pump having a motor and a speed regulator for regulating the speed of the motor and thereby the velocity output of the pump;

each of said channels having a pressure transducer for monitoring the velocity of stock flowing through its upstream portion;

a separate pressure transmitter connected to each of the pressure transducers;

a separate differential pressure transmitter connected to each of said pressure transmitters;

a pressure transducer monitoring the pressure in the downstream portion of one of said channels adjacent to said slice opening and connected to a pressure transmitter which transmits signals to all of the differential pressure transmitters for comparison in said differential pressure transmitters;

separate means receiving signals from each of said differential pressure transmitters for effecting comparison of the stock velocities in said channels;

controlling means connected in controlling relation to the speed regulator of the motor of the pump which drives the stock in the duct supplying stock to another of said channels;

and means connected to the means receiving signals which is operatively connected to the pressure transducer which monitors the upstream portion of said one channel to generate a setpoint to said controlling means and thereby through the speed regulator connected thereto regulating the speed of the pump supplying stock to said another of said channels as a function of the speed of the pump supplying said one channel.

14. A method of controlling multi-channel paper machine distributor of the type having therein a plurality of channels to which fibrous paper stocks are respectively supplied from different respective sources through separate ducts supplying the paper stocks to upstream ends of the channels and a perforated partition within the distributor spaced from said upstream ends and through which the paper stocks pass from upstream portions of the channels into downstream portions of the channels which converge toward a slice opening which delivers the stocks from the plurality of channels in multi-ply relation to travelling forming means of a papermaking machine and wherein there is a velocity differential between the stock flowing through the channels upstream from said partition in comparison with the stock flowing through said downstream portions of the channels, comprising:

operating a respective pump in each of said ducts and thereby driving the stocks under controlled velocity into the respective channels to be supplied with stock from the ducts;

operating a separate motor to drive each of the pumps;

monitoring through a pressure transducer in each of the channels upstream from said perforated partition the velocity of stock flowing through the respective channels;

transmitting stock flow velocity information from each of the transducers to a separate pressure transmitter and from each of the pressure transmitters to a separate differential pressure transmitter;

monitoring through a downstream pressure transducer the pressure in the downstream portion of one of said channels adjacent to said slice opening and from a pressure transmitter connected to the downstream pressure transducer transmitting signals to all of the pressure differential transmitters and therein comparing any differences in pressure in said downstream portion of said one channel with the pressures in said upstream portions of the channels;

generating a setpoint pursuant to information received from the pressure transducer monitoring the upstream portion of said one channel;

and in response to said setpoint regulating the speed of the pump supplying stock to said another of said channels as a function of the speed of the pump supplying said one channel.

4,086,131

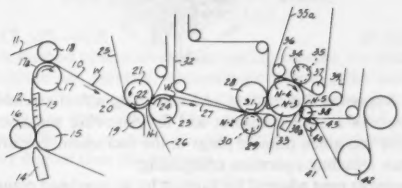
METHOD FOR PRESSING BAGASSE WEBS

Cornelius N. Rempel, and Merle G. Linkletter, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed May 6, 1975, Ser. No. 574,878

Int. Cl.² D21F *3/04, 3/06*

U.S. Cl. 162—203 **4 Claims**



1. The method of forming a continuous web from a slurry of bagasse fibers comprising:

projecting a slice stream of bagasse slurry between a pair of looped traveling forming wires and draining water through the wires for forming a one-sided web;

lifting the formed web off one of the wires and substantially immediately passing the web through a first press nip sandwiched between a first upper press felt and a second lower press felt for pressing water uniformly from the web in both directions;

passing the web through a second press nip sandwiched between said second press felt and a third press felt and supporting the web from the one forming wire continuously through said first nip on the lower surface of the first felt, supporting the web on the second press felt from the first nip through the second nip;

laying the web on a plain roll after the second nip, supporting the web continuously on said third felt between the second nip and plain roll;

pressing the web against the plain roll in a third nip with the third nip formed between the third press felt and the plain roll;

maintaining the web on the plain roll after the third nip and passing the web against the plain roll in a fourth nip with a fourth press felt being outwardly of the web;

removing the web from the plain roll after the fourth nip for transfer to a dryer section;

applying a pressure in the first press nip in the range of 200 to 250 pounds per linear inch;

applying a pressure in the second nip in the range of from 300 to 350 pounds per linear inch;

applying a pressure in the third press nip in the range of 350 to 400 pounds per linear inch;

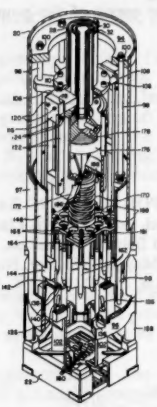
and applying a pressure in the fourth nip in excess of 500 pounds per linear inch.

4,086,132

COMBINED FUEL ASSEMBLY AND THIMBLE PLUG GRIPPER FOR A NUCLEAR REACTOR

Robert E. Meuschke, Penn Hills Township, Alleghany County, and Adelbert E. Satterlee, Plum Borough, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 13, 1976, Ser. No. 685,827
Int. Cl.[2] G21C *19/20, 7/08*
U.S. Cl. 176—30 18 Claims



1. Apparatus for loading and unloading a fuel assembly in the core of a nuclear reactor and for removing and inserting control rod guide thimble plugs in the fuel assembly during a reactor refueling operation comprising:

a gripper mast adapted for support by an overhead crane and arranged to be connected to a mast raising and lowering device thereon which effects vertical movement of said mast in a housing permanently mounted on said crane, said crane being horizontally movable on the top wall of a containment for said reactor and into a position wherein the mast is placed in alignment with a fuel assembly to be removed from said core;

said gripper mast comprising a cylinder approximately as long as a fuel assembly;

a first actuator on said mast;

means connecting said actuator to fuel assembly gripper fingers pivotally mounted in said mast at spaced intervals around the bottom thereof for selectively moving said fingers into and out of latching engagement with said fuel assembly;

said means connecting said actuator to the fuel assembly gripper fingers including axially movable bars having a pin on the end thereof which fits into a slot provided in each of said fingers so that when the actuator moves said bars downwardly, the pins ride in said slots and move the fingers into a fuel assembly nozzle latching position, while movement of the bars upwardly causes the fingers to move to an unlatching position;

a pair of spaced grooves on the upper surface of each of said fingers;

a movable sleeve in said mast;

locking keys mounted on said sleeve and respectively in a position above and in alignment with at least one of the grooves provided in each of said gripper fingers;

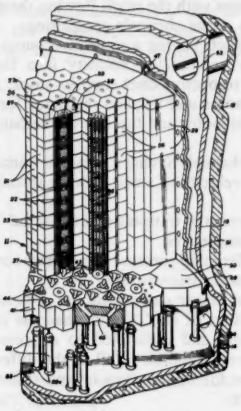
so that when said gripper fingers are in a latched position, the keys respectively engage the grooves on top said fingers which correspond to a latched position, and when the fingers are in an unlatched position, said keys engage the grooves corresponding to an unlatched position thereby respectively locking said fingers in either latched or unlatched positions.

4,086,133

NUCLEAR REACTOR CORE REFUELING METHOD

Paul Michael Anderson, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Sep. 7, 1976, Ser. No. 720,746
Int. Cl.[2] G21C *19/20, 3/30;* B66C *17/08*
U.S. Cl. 176—30 9 Claims



1. A method for refueling a nuclear reactor core inside a reactor vessel, said core having a plurality of regions each comprised of a plurality of substantially horizontal layers, each layer being comprised of a plurality of individual fuel elements with the corresponding fuel elements in respective layers forming substantially vertical columns extending transversely of the layers, and wherein the fuel elements in at least the lowermost layer thereof are spent, said method comprising, refueling the regions in sequence by, for each region, removing from the pressure vessel unspent fuel elements in at least one but not all of said columns to expose at least one but not all of the spent fuel elements therein, removing from the pressure vessel the exposed spent fuel elements, moving within the pressure vessel unspent fuel elements to other locations including the former locations of at least some of the previously removed spent and unspent fuel elements to expose additional spent fuel elements, removing from the pressure vessel the exposed additional spent fuel elements, placing the unspent fuel elements which were previously removed from the pressure vessel at other locations in the core, placing new unspent fuel elements in the pressure vessel in at least the uppermost layer of fuel elements, and repeating this sequence for the other regions to complete refueling the core.

4,086,134

METHOD FOR PREPARATION OF VACCINE AGAINST FELINE LEUKEMIA

William Fleming Hoggan Jarrett; James Oswald Jarrett, and Lindsay Joan Mackey, all of Glasgow, Scotland, assignors to University of Glasgow, Glasgow, Scotland

Continuation of Ser. No. 668,110, Mar. 18, 1976, which is a division of Ser. No. 505,625, Sep. 13, 1974, Pat. No. 3,966,907.
This application Feb. 22, 1977, Ser. No. 770,723
Claims priority, application United Kingdom, Sep. 18, 1973, 43642/73
Int. Cl.[2] A61K *39/12*
U.S. Cl. 195—1.2 1 Claim

1. A method for manufacturing a vaccine for the prevention of disease caused by feline leukemia virus which comprises culturing at least 10^7 feline lymphoblastoid cells chronically infected with FELV of low infectivity and thereby having viral associated antigen on their surface, inactivating said cells by chemical or physical irradiation or thermal means without destroying immunogenicity, and harvesting the cells.

4,086,135

PROCESS FOR STEPPING GRAIN AND PRODUCTS OBTAINED THEREFROM

Ramon Cairo Balana, and Antonio Montserrat Caixes, both of Barcelona, Spain, assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Dec. 16, 1974, Ser. No. 533,393
Claims priority, application Spain, Dec. 14, 1973, 421.472
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—17 8 Claims

1. In the process of steeping grain in warm acidulated water at the beginning of the wet milling process for the separation and recovery of the various components of the grain, the improvement comprising adding an inoculum of a microorganism of the genus Lactobacillus to the warm acidulated water in which the grain is steeped.

4,086,136

PROCESS FOR PRODUCING A PEPTIDE USING A SERINE OR THIOL PROTEINASE

Yoshikazu Isowa; Muneki Ohmori, both of Tokyo; Hideaki Kurita, Sagamihara; Tetsuya Ichikawa, Sagamihara; Masanari Sato, Sagamihara, and Kaoru Mori, Sagamihara, all of Japan, assignors to (Zaidanhojin) Sagami Chemical Research Center, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,543
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 10 Claims

1. A process for producing a peptide having the formula

X—A—B—Y

wherein

A and B are the same or different and represent an amino acid residue or a peptide residue;

X represents an amino protective group; and

Y represents a carboxyl protective group selected from the group consisting of tertiary alkoxy, and benzyloxy, benzylamino and benzhydrylamino which can be substituted with an inert substituent, which comprises:

reacting an acid component of an amino acid or peptide having N-terminal protective group or a salt thereof of the formula X-A-OH with an amino component of an amino acid or peptide having a C-terminal protective group or a salt thereof of the formula

H—B—Y

in the presence of a thiol proteinase or serine proteinase enzyme in an aqueous solution having a pH sufficient to maintain the enzyme activity of said thiol proteinase or serine proteinase.

4,086,137

PROCESS FOR THE PRODUCTION OF L-ARGININE BY FERMENTATION

Kiyoshi Nakayama, Sagamihara; Kazumi Araki, Machida, and Hajime Yoshida, Sagamihara, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 8, 1977, Ser. No. 766,630
Claims priority, application Japan, Feb. 18, 1976, 51-15737
Int. Cl.[2] C12D *13/06*
U.S. Cl. 195—29 9 Claims

1. A process for producing L-arginine which comprises culturing a mutant strain of microorganism derived from an L-arginine producing strain belonging to the genus Bacillus, said mutant having a nutritional requirement for at least one member of the group consisting of methionine, histidine, threonine, proline, isoleucine, lysine, adenine, guanine, uracil and precursors of uracil in a nutrient medium until L-arginine is formed in the culture liquor, and thereafter isolating said L-arginine therefrom.

4,086,138

PROCESS FOR PRODUCING GLUCOSE ISOMERASE

Ichiro Kojima; Hiroshi Sato, both of Yokohama, and Yasuo Fujiwara, Tokyo, all of Japan, assignors to Nippon Oil Company, Ltd., Japan

Filed Jan. 28, 1977, Ser. No. 763,540
Claims priority, application Japan, Feb. 3, 1976, 51-9962
Int. Cl.[2] C12D *13/10, 13/02;* C07G *7/02*
U.S. Cl. 195—65 8 Claims

1. A process for producing glucose isomerase which comprises cultivating Corynebacterium candidus under aerobic conditions in a culture medium containing carbon sources and nitrogen sources and separating the glucose isomerase-containing cells from the culture broth.

5. A process for producing glucose isomerase which comprises cultivating *Corynebacterium cerenus* under aerobic conditions in a culture medium containing carbon sources and nitrogen sources and separating the glucose isomerase-containing cells from the culture broth.

4,086,139

DIFFERENTIAL INACTIVATION OF AMYLASE IN AMYLASE-PROTEASE MIXTURES

Raymond D. Hoerle, Highland Park, Ill., assignor to GB Fermentation Industries Inc., Kingstree, S.C.

Filed Apr. 9, 1976, Ser. No. 675,385
Int. Cl.[2] C07G *7/02*
U.S. Cl. 195—66 R 19 Claims

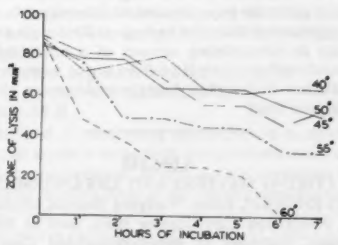
1. A method of selectively inactivating amylase in a mixture of protease and amylase, comprising contacting the mixture with an oxidizing agent selected from the group consisting of hypochlorite ions, chlorite ions and mixtures thereof in an amount effective to inactivate the amylase to a substantially greater degree than the protease.

4,086,140

PROCESS FOR ISOLATING FIBRINOLYTIC SUBSTANCES

John Burnham King, Sandown Lodge, Glebe Rd., Rondebosch, Cape, South Africa

Division of Ser. No. 628,006, Nov. 3, 1975, Pat. No. 4,039,658, which is a division of Ser. No. 347,254, Apr. 2, 1973, abandoned.
This application May 27, 1977, Ser. No. 801,348
Claims priority, application South Africa, Apr. 5, 1972, 72/2311
Int. Cl.[2] C07G *7/026*
U.S. Cl. 195—66 B 6 Claims



1. A process for isolating a proteinaceous fibrinolytic caseinolytic composition derived from mammalian bile having a molecular weight range of 5,000 to 50,000, characterized by the following properties:

(a) insolubility in aqueous ammonium sulfate,

(b) will dissolve fibrin but not active plasminogen, trypsinogen and chymotrypsinogen,

(c) at pH 7.4, will act as an anion,

(d) will inhibit platelet aggregation by collogen,

(e) insolubility in chloroform and in methanol,

which comprises adding to mammalian bile a precipitating

agent for protein, thereby precipitating said proteinaceous composition.

4,086,141

PROCESS FOR THE FERMENTATION PRODUCTION OF ERGOLINE DERIVATIVES

Eva Borowski; Klaus Braun, both of Radebeul; Klaus Breuel, Dresden; Christoph Dauth, Radebeul; Dieter Erge, Halle; Werner Grawert, Radebeul; Detlev Gröger, Halle; Liselotte Höhne, Dresden; Edda Knothe; Monika Müller, both of Radebeul; Gisela Nordmann, Dresden; Rudolf Schirutschke, Radebeul, and Klaus-Dieter Volzke, Dresden, all of Germany, assignors to VEB Arzneimittelwerk Dresden, Radebeul, Germany

Filed Nov. 8, 1976, Ser. No. 740,137
Int. Cl.² C12D *13/02*
U.S. Cl. 195—81 **22 Claims**

1. A method for obtaining ergoline derivatives by a fermentation process, the said derivatives including alkaloids and 9,10-dihydrogenated alkaloids of the ergotoxine group and including ergometrine, and

the said process comprising

growing conidiospores under saprophytic conditions from a strain of *Claviceps purpurea* (Fr.) Tul. deposited under number IMET PA 130 at the Institute for Microbiology and Experimental Therapy at Jena, German Democratic Republic, then employing these spores as inoculum in a submerged culture in a culture medium under aerobic conditions, and at the completion of the cultivation extracting the formed alkaloids from the filtrate or from the mycelium or directly from the culture medium, and if 9,10-dihydrogenated alkaloids are wanted then subjecting the recovered alkaloids to a 9,10-dihydrogenation.

4,086,142

DECARBOXYLATION OF ENDOGENOUS SERUM GLUTAMATE IN TRANSAMINASE ASSAYS

Charles Y. Huang, Potomac, Md., and William S. Stavropoulos, Carmel, Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 6, 1976, Ser. No. 747,860
Int. Cl.² G01N *31/14*
U.S. Cl. 195—103.5 R **6 Claims**

1. In a colorimetric method for the determination of glutamic transaminase activity in biological fluids having endogenous glutamate present wherein the transaminase activity is determined by an assay for the amount of glutamate generated by an amino acid and α-oxoglutarate in the presence of the glutamic transaminase by measuring the absorbance of a color reaction product the improvement which comprises incubating prior to glutamate assay the biological fluid with an effective glutamate decarboxylating amount of a microbial glutamic acid decarboxylase at a pH of from about 4 to about 5 for a time sufficient to decarboxylate the endogenous glutamate in the biological fluid.

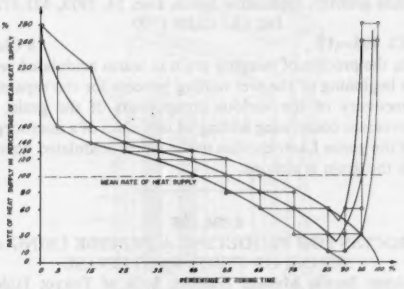
4,086,143

COKING METHOD AND ARRANGEMENT

Heinrich Echterhoff, Essen; Wolfgang Simonis, Gladbeck; Wolfgang Rohde, and Kurt-Gunther Beck, both of Essen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Continuation-in-part of Ser. No. 181,886, Sep. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 851,700, Aug. 20, 1969, abandoned. This application Jul. 22, 1976, Ser. No. 707,874
Claims priority, application Germany, Aug. 24, 1968, 1796063
Int. Cl.² C10B *47/00*
U.S. Cl. 201—41 **13 Claims**

1. In a process for coking coal in a coke oven chamber in which the heat required to carry out the coking operation is generated by combustion of gaseous fuels in flues in the walls of the said coke oven chamber and is supplied to the said coke oven chamber by conduction through the said walls, the improvement wherein the supply of heat to the said coke oven chamber is effected exclusively in accordance with a pre-established schedule expressed in percentages of a pre-established mean heat supply rate that is dependent upon the length of the



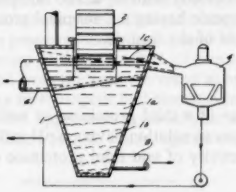
total period required to complete the said coking process, the said schedule providing for an initial coking period during which heat is supplied at a rate much higher than the said mean heat supply rate followed by a continuous gradual decrease of the rate of heat supply during the remainder of the coking period up to at least a final portion of the coking period.

4,086,144

PROCESS AND APPARATUS FOR THE SEPARATION OF FLOAT TARS IN THE TAR SEPARATOR OF A COKING INSTALLATION

Heinz Grulich, Gladbeck, and Ernst Otte, Essen, both of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Continuation-in-part of Ser. No. 632,360, Nov. 17, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,326
Claims priority, application Germany, Nov. 16, 1974, 2454394
Int. Cl.² C10B *45/00, 57/00*
U.S. Cl. 201—41 **6 Claims**



1. A process for the separation of so-called float tar occurring in a tar separator where float tar, crude tar and ammonia-water layers are formed in the mass received for separation from the collector chamber of a coking installation, the said process comprising the steps of skimming the float tar consisting of a mixture of tar, coal dust, water and gas bubbles off the ammonia-water mixture flowing above the crude tar and passing the skimmed float tar to a comminuting and homogenizing zone and homogenizing and comminuting the float tar therein so as to convert it into a high viscosity tar which is then further processed either separately or together with the bulk of the crude tar.

4. An installation for the separation of float tar occurring in the tar separator of a coking plant where an ammonia water-crude tar mixture is received from a collector chamber of the coking plant, said installation comprising an open-top tar separator for receiving and separating said float tar and said ammonia-water mixture from said crude tar;

a channel in said tank separator normally floatingly supported on said ammonia-water mixture and extending across said tank separator;

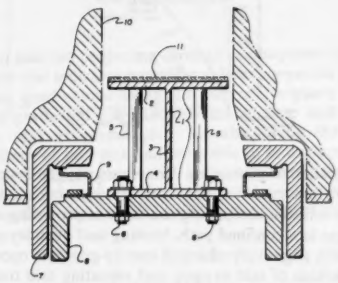
skimming means in the form of a bucket wheel revolving in said tank separator for skimming the float tar from the ammonia-water mixture flowing in the tank separator and for passing the separated float tar into said channel; and

a comminution and homogenizing means provided at one end of said channel for receiving and processing said float tar, whereby a high viscosity tar is formed from said float tar by the comminution and homogenizing means which is then passed for further processing separately or together with the bulk of the crude tar.

4,086,145
COKE OVEN DOOR LINING

Joseph M. Muller, Edgeworth, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Mar. 14, 1977, Ser. No. 777,258
Int. Cl.² C10B *25/06*
U.S. Cl. 202—248 **9 Claims**



1. A vented metallic coke oven door lining assembly, connected to a coke oven door frame comprising:

a metallic, generally flat barrier for preventing coal and coke from piling against said coke oven door frame and thereby preventing coke oven gas from easily rising to the top of the coke oven, said barrier having a length sufficient to extend approximately from top to bottom of a coke oven interior, a width sufficient to extend approximately from one coke oven sidewall to the other, and spaced apart a sufficient distance from and generally parallel to said coke oven door to permit coke oven gases to rise essentially unimpeded upwardly between said barrier and said coke oven door for supporting and maintaining said barrier in position; said support means not essentially obstructing the space between the barrier and coke oven door so as to enable coke oven gases to pass essentially unimpeded upwardly through said space and to thereby lower the gas pressure in the oven interior at the coke oven door location and to reduce the tendency of coke oven gases to leak from the coke oven interior.

4,086,146
WATER TREATING PROCESS

Jacob Block, Rockville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 631,344, Nov. 12, 1975, abandoned. This application Mar. 3, 1977, Ser. No. 774,097
Int. Cl.² C23F *11/10*; B01D *3/34*
U.S. Cl. 203—7 **3 Claims**

1. A process for inhibiting the deposition of scale onto the heat exchange surfaces in a seawater distillation plant which comprises adding to the liquid in the plant a composition consisting essentially of a copolymer of a member of the group consisting of maleic anhydride and maleic acid and a member of the group consisting of furan and salts thereof, the ratio of maleic component to furan in the reactant solution being 0.67 to 1.5; and the copolymer being present in a concentration of 0.1 to 15 parts per million.

4,086,147
POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

Filed Dec. 10, 1976, Ser. No. 749,406
Int. Cl.² B01D *3/34*; C07D *7/18*
U.S. Cl. 203—9 **11 Claims**

1. A process for inhibiting the polymerization of a readily polymerizable vinyl aromatic compound during the distillation thereof at elevated temperatures of from about 150° to about 250° F. comprising:

a. distilling said vinyl aromatic compound at said elevated temperatures in the presence of an amount of m-nitro-p-cresol sufficient to substantially inhibit formation of vinyl aromatic polymer due to said elevated temperatures; and

b. recovering said vinylaromatic compound from said distillation step with a minimum loss due to the polymerization thereof at said elevated temperatures.

4,086,148
PROCESS OF MAKING ETCHED ALUMINUM SHEETS AND ELECTROLYTIC CAPACITORS FORMED THEREFROM

Michel Badia, Echirolles, France, assignor to Societe Anonyme de Traitement des Metaux et Alliages (SATMA), Goncelin, France

Filed Nov. 19, 1976, Ser. No. 743,128
Claims priority, application France, Dec. 8, 1975, 75 38228
Int. Cl.² C25D *11/04*; C25F *3/04*; H01G *9/00*; C22C *21/00*
U.S. Cl. 204—33 **1 Claim**

1. In a low voltage electrolylic capacitor formed of a cold-rolled electro-chemically etched, anodized sheet formed from a refined aluminum base alloy having an aluminum content of at least about 99.99% and including chromium, the improvement comprising said sheet having a final chromium content of between about 0.002% and about 0.2% and being formed by said cold-rolling and electro-chemical etching without intervening recrystallization annealing whereby said sheet imparts improved electrical and mechanical properties to the capacitor.

4,086,149
CATHODE ELECTROCATALYST

Aleksandrs Martinsons, Wadsworth, and Marilyn Crenshaw, Copley, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 4, 1976, Ser. No. 711,759
Int. Cl.² C25B *1/34, 11/04*
U.S. Cl. 204—59 R **3 Claims**

1. In a method of conducting electrolysis in an electrolytic cell having an anode in an anolyte compartment and a cathode in a catholyte compartment, which method comprises feeding an alkali metal chloride brine to the anode compartment, passing an electrical current from said anode to said cathode whereby to evolve chlorine at said anode and hydrogen at said cathode, the improvement wherein said cathode has a ferrous substrate with an electroconductive surface thereon, said electroconductive surface being prepared by the method comprising:

inserting the ferrous substrate into an electroless plating solution comprising:

a. a tungsten salt;

b. salts chosen from the group consisting of cobalt salts, nickel salts, and mixtures thereof;

c. a phosphorous containing reducing agent;

d. an acid complexing agent; and

e. a buffering agent;

electrolessly depositing a coating from said solution onto said substrate; and

subsequently electrolytically depositing from said electroless plating solution a coating of at least 3×10^{-5} equivalents per square centimeter of substrate from said solution onto said substrate as a cathode whereby to provide a coating on said substrate comprising tungsten, phosphorous, and a metal chosen from the group consisting of cobalt, nickel, and mixtures thereof.

4,086,150
CHROMATE REMOVAL BY PRECIPITATION

Bruno Kindl, Kingston, and Jennifer Geraldine Atkinson, Amherstview, both of Canada, assignors to Huron Chemicals Limited, Kingston, Canada

Filed Jun. 27, 1977, Ser. No. 810,544
Int. Cl.[2] C25B *1/26;* C01B *17/00*
U.S. Cl. 204—95 **16 Claims**

1. A method of removing chromate from aqueous alkali metal chlorate solutions which comprises:

adding to a chromate-containing aqueous solution of an alkali metal chlorate, at a temperature of about 40° to about 60° C, a water-soluble sulfide in an amount ranging from about 70 to about 200% of the stoichiometric value required to react with said chromate, said aqueous solution having an initial pH in the range of 7–8;

then adding to said solution a water-soluble ferrous salt in an amount ranging from about 30 to about 100% of the stoichiometric value required to react with said chromate, and adjusting the pH of the solution such that the final pH is in the range of about 1.8 to about 3.0, whereby said chromate is converted to an insoluble trivalent chromium-containing material and the sulfide is completely converted to elemental sulfur; and

separating said insoluble trivalent chromium-containing material from said solution.

4,086,151
CURABLE MIXTURES AND CURED RESINS MADE FROM LINEAR POLYMERS OF GLYCIDOL

Violete L. Stevens; Arthur R. Sexton, both of Midland, Mich., and Frederick P. Corson, Sudbury, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 715,586, Aug. 18, 1976, abandoned, which is a continuation-in-part of Ser. No. 444,078, Feb. 20, 1974, Pat. No. 4,014,854. This application Jun. 30, 1977, Ser. No. 811,514
Int. Cl.[2] C08F *2/46;* C08G *23/22*
U.S. Cl. 204—159.16 **13 Claims**

1. A curable mixture comprising: Component (a) a compound represented by the formula R $((R'O)_mX)_n$ wherein R is the residue left by removal of n active hydrogen atoms from an initiator compound, RH_n; each R' independently is an alkylene radical selected from the group consisting of ethylene, trimethylene, tetramethylene, 1,2-butylene, 2,2-bis(halomethyl)-1,3-propylene, and groups of the formula

$$-CH_2CHCH_2A,$$
$$\quad\;|$$

each A independently is H, Cl, Br or OX; each X independently is H or the acyl radical of a carboxylic acid with the proviso that at least one R' is 3-hydroxyl-1,2-propylene and at least one is a group of the formula

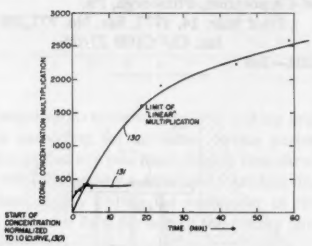
$$-CH_2CHCH_2OX$$
$$\quad\;|$$

wherein X is the acyl radical of an α,β-unsaturated carboxylic acid; and m and n are integers such that the total number of R'O groups is at least 2, n being 1–8; and Component (b) a polyfunctional compound which is reactive with the primary hydroxyls or with the α,β-unsaturated portions of X in Component (a) and which upon reaction with Component (a) forms a cross-linked composition therewith wherein Component (b) is selected from the group consisting of polyisocyanates, polyisothiocyanates, polycarboxylic acids, polyoxiranes and poly(vinylic unsaturated) compounds.

4,086,152
OZONE CONCENTRATING

Stanley R. Rich, Eastman, N.H., and Theophanes G. Pantazelos, Framingham, Mass., assignors to RP Industries, Inc., Hudson, Mass.

Filed Apr. 18, 1977, Ser. No. 788,149
Int. Cl.[2] B01K *1/00;* C01B *13/11*
U.S. Cl. 204—176 **10 Claims**



1. A method of generating ozone in an oxygen-bearing gas to produce a concentration of ozone in said gas in excess of 10,000 parts per million, comprising the steps of providing a quantity of said gas in a confined path, treating said quantity essentially solely with negatively charged ions to generate ozone from a minor portion of said oxygen, and repeating said treatment of substantially all of said quantity of said gas a plurality of times to increase the concentration of said ozone substantially linearly with respect to energy consumption to a level in excess of 10,000 parts per million.

4,086,153
METHOD OF PRODUCING A COMPOSITE COATED STEEL SHEET

Keiji Ariga, Fuchu; Nobuyuki Tsutsui, and Katsumi Kanda, both of Kudamatsu, all of Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,529
Claims priority, application Japan, Nov. 4, 1975, 50-121425
Int. Cl.[2] C25D *13/06, 13/10*
U.S. Cl. 204—181 R **10 Claims**

1. A method of producing a composite coated steel sheet which comprises electrolytically treating a steel sheet in a suspension solution consisting essentially of a water-soluble resin or a water-dispersible resin; a water-dispersible sol of a metal compound and an infusible organic polymer resin powder, removing the coated steel sheet from the suspension solution and then curing the coated steel sheet by heat treatment.

4,086,154
APPARATUS FOR DETERMINING STRESS IN AN ELECTRODEPOSIT

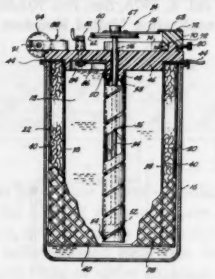
Harry C. Hicks, Puyallup, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 26, 1976, Ser. No. 708,401
Int. Cl.[2] G01L *1/00*
U.S. Cl. 204—195 R **9 Claims**

1. In a spiral contractometer for determining the stress within an electrodeposit wherein said spiral contractometer includes a spiral substrate suspendible in an electrolytic solution as the cathode of an electrodeposition cell, a first end of

said spiral substrate being rigidly affixed to a support plate positioned above the surface of said electrolytic solution, said spiral contractometer including a rod extending downwardly through the central opening of said spiral substrate with a first end of said rod securely attached to the second end of said spiral substrate, the second end of said rod projecting upwardly through an opening in said support plate, the improvement comprising:

a vernier dial indicator directly connected to said second



end of said rod projecting through said support plate, said vernier dial indicator including at least a segment of a disk having graduations along the curved periphery thereof and a graduated plate slidably mounted to said support plate, said graduated plate movable along the curved periphery of said disk and securable to said support plate in a selected orientation with said graduations of said disk, said rod supported solely by said attachment between said first end of said rod and said second end of said spiral substrate.

4,086,155

ELECTROLYZER WITH RELEASED GAS

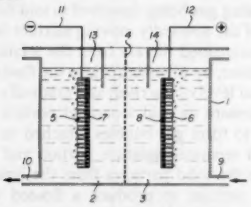
Pierre Jonville, Plan-les-Ouates, Switzerland, assignor to Battelle Memorial Institute, Geneva, Switzerland

Filed Apr. 21, 1976, Ser. No. 678,745

Claims priority, application Switzerland, Apr. 25, 1975, 5365/75

Int. Cl.² C25B *1/16, 1/26, 11/03, 11/10*

U.S. Cl. 204—266 **7 Claims**



1. An electrolyzer comprising at least one cathode and at least one anode disposed in an aqueous electrolyte bath, the electrodes each having at least one active surface directed substantially in facing relation to at least one active surface of the electrode of opposite polarity, at least one of said electrodes being permeable to the gas and being the source of a gas release at the time of operation of the electrolyzer, a distinct porous layer applied to and covering at least one portion of said active surface of said one electrode permeable to the gas, said porous layer being constituted by at least one refractory oxide which is electrically insulative and chemically inert with regard to the electrolyte and to the products formed at the time of electrolysis, at least in the range of normal operating temperature of the electrolyzer, said layer having a homogeneous distribution of pore sizes of an absolute value sufficient for the electrolyte to traverse this layer and impregnate the electrode, the mean value of the radii of the pores of the said insulating refractory oxide layer being at least as small as one-tenth of that of the pores of the electrode that it covers, said electrode and the said oxide layer cooperatively forming an element of selfsupporting structure, said oxide layer constituting a surface portion in contact with the electrolyte.

4,086,156

PITCH BONDED CARBON ELECTRODE

Ghazi Mourad Dickakian, Brussels, Belgium, assignor to Exxon Research & Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 637,223, Dec. 3, 1975, abandoned. This application Apr. 18, 1977, Ser. No. 788,404

Claims priority, application United Kingdom, Dec. 13, 1974, 53926/74

Int. Cl.² C25C *7/02;* **C10C** *3/00, 3/06*

U.S. Cl. 204—294 **13 Claims**

1. A process for preparing chemical pitch which comprises stripping under reduced pressure steam cracker tar to obtain a pitch having an initial boiling point of between 350° C and 400° C at atmospheric pressure, heat soaking the pitch at 360° C to 420° C in the absence of air or oxygen at a pressure in the range of from sub-atmospheric to 4 atmospheres absolute and stripping under reduced pressure the soaked pitch to obtain a product having a minimum softening point (R and B) of 75° C.

11. Chemical pitch whenever prepared by a process claimed in claim 1.

13. An electrode comprising coke and 26 to 32 wt.% based on the weight of coke of chemical pitch as claimed in claim 11.

4,086,157

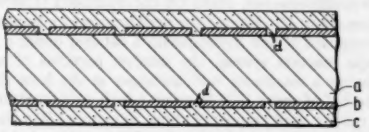
ELECTRODE FOR ELECTROCHEMICAL PROCESSES

Konrad Koziol, Rothenbach an der Pegnitz; Karl-Heinz Sieberer, Zirndorf uber Nurnberg, and Hans-Carl Rathjen, Rothenbach an der Pegnitz, all of Germany, assignors to C. Conradty, Germany

Continuation-in-part of Ser. No. 438,388, Jan. 31, 1974, abandoned, and a continuation-in-part of Ser. No. 234,846, Mar. 15, 1972, abandoned. This application Apr. 15, 1976, Ser. No. 677,083

Int. Cl.² C25B *11/10*

U.S. Cl. 204—290 F **15 Claims**



1. In an electrode for electrode processes and comprising a valve metal as a base member the improvement which comprises:

a. a base layer coated on said base member and comprising an electrically conductive chemical element having no substantial valve effect; and

b. a gas-tight and liquid-tight cover layer on said base layer and comprising:

1. a valve metal oxide selected from the group consisting of titanium dioxide and tantalum oxide;

2. a doping material to increase the electrical conductivity of said valve metal oxide and comprising, when titanium oxide is said valve metal oxide, an oxide selected from the oxides of niobium, tungsten, molybdenum, antimony, and tin and comprising, when tantalum oxide is said valve metal oxide, an oxide selected from the oxides of tungsten, molybdenum, antimony, and tin;

3. at least one of the oxides stable in an electrolysis medium selected from the oxides of barium, gallium, germanium, lead, bismuth, selenium, tellurium, copper,

cadmium, the rare earth elements, manganese, iron, cobalt, and nickel;

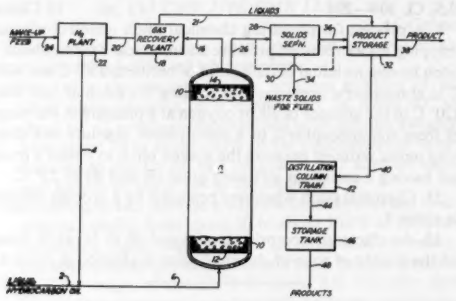
wherein the proportion of said doping material in said valve metal oxides is less than about 28 mol percent of the mixture and the proportion of said stable oxides in said cover layer is greater than about 50 mol percent.

4,086,158

PROCESS FOR UPGRADING SOLIDS-CONTAINING LIQUID HYDROCARBON OILS

Howard G. McIlvried, Pittsburgh, and Angelo A. Montagna, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sep. 24, 1976, Ser. No. 726,146
Int. Cl.[2] C10G *23/02, 23/16*
U.S. Cl. 208—264 **14 Claims**



1. In a process wherein a solids-containing liquid hydrocarbon oil and hydrogen are contacted with a hydrogenation catalyst in a single stage to upgrade said liquid hydrocarbon oil the improvement which comprises passing said liquid hydrocarbon oil, together with said solids, and said hydrogen under hydrogenation conditions, which include a temperature of about 260° to about 480° C., a pressure of about 500 to about 10,000 pounds per square inch gauge, a weight hourly space velocity between about 0.25 to about 50 pounds of liquid hydrocarbon oil per pound of catalyst per hour and hydrogen in amounts between about 1000 to about 20,000 standard cubic feet per barrel of liquid hydrocarbon oil, while maintaining a Reynolds number, based on the hydrogen flow rate, greater than about 10, through the void spaces of a fixed catalyst bed composed of said hydrogenation catalyst under a flooded-bed type reaction system, the catalyst particles of said catalyst having a maximum wall thickness in the least thick portion thereof of about 1/32 to about ¼ inch, said catalyst bed having a reactor void volume of about 50 to about 90 volume percent, and thereafter removing solids from said treated hydrocarbon oil.

4,086,159

SOLVENT EXTRACTION OF AROMATIC HYDROCARBONS WITH ETHYLENE OXIDE POLYOL ADDUCTS

Clyde Edward Baxter, Angleton, and Arthur Emilio Gurgiolo, Lake Jackson, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 13, 1976, Ser. No. 722,847
Int. Cl.[2] C10G *21/16*
U.S. Cl. 208—333 **7 Claims**

1. A process for the separation of aromatic hydrocarbon compounds from mixtures containing both aromatic and non-aromatic hydrocarbon compounds which comprises:

(A) contacting a mixture containing both aromatic and non-aromatic hydrocarbon compounds with an ethoxylated alkane polyol solvent having at least three ethoxylated hydroxyl groups and a number average molecular weight range from about 250 to about 1100 to from an extract contained said solvent and the aromatics wherein said polyol is derived by ethoxylating an alkane polyol having 3-6 carbon atoms and 3-4 hydroxyl groups, and

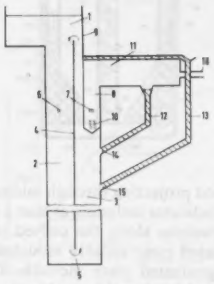
(B) separating said extract from the non-aromatic hydrocarbon compounds.

4,086,160

TREATMENT OF SOLIDS-LIQUID-GAS MIXTURES

Frank Cornelius Roesler, Stockton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jul. 8, 1976, Ser. No. 703,663
Claims priority, application United Kingdom, Jul. 10, 1975, 29058/75
Int. Cl.[2] C02C *1/06*
U.S. Cl. 210—7 **7 Claims**



1. A method of treating a waste water mixture containing solid particles and biologically degradable material in apparatus including a basin, a downcomer, a riser operatively communicating with the downcomer both through the basin and at the lower end of the downcomer, and a floatation chamber operatively connected to the riser and extending upwardly therefrom, said method comprising the steps of continuously circulating the mixture contained in the basin-downcomer-riser system down said downcomer, up said riser, and back down said downcomer until sufficient treatment of the biologically degradable material is achieved, and supplying oxygen-containing gas to said downcomer so that said gas flows co-currently with mixture flowing down said downcomer, and upwardly with said mixture in said riser, at least some of the oxygen-containing gas being dissolved in said mixture: separating a portion of the upwardly moving mixture in the riser with dissolved gas contained therein from the mixture moving upwardly in the riser, by diverting it into the floatation chamber, at a first vertical level of the riser; and gradually decreasing the hydrostatic pressure on said separated portion to release gas from solution to form gas bubbles attached to solid particles present in said separated mixture portion and thereby effectively separate the solid particles from the liquid in the separated mixture portion to produce a floated solids-enriched mixture, wherein the improvement comprises

hydrostatically feeding the floated solids-enriched mixture into the riser from the chamber at a second level, below said first level, the driving force for entry at the second level being provided by the lower relative density, as a result of its content of gas bubbles, of the mixture flowing upwardly in the riser.

4,086,161

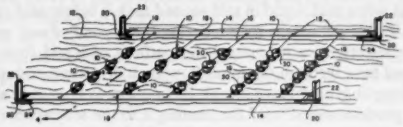
ECOLOGICAL SYSTEM AND METHOD

Robert Edward Burton, 222 Franklin, Willits, Calif. 95490

Filed Dec. 13, 1976, Ser. No. 750,121
Int. Cl.[2] C02C *5/10*
U.S. Cl. 210—13 **15 Claims**

1. In a process for maintaining the trophic balance between algae, algal feeders and the like, in an open body of water subject to eutrophication, the steps of isolating a profusion of

substantially individualized bark fibers by adhering the same to relatively flat flotation disc members forming self-contained flotation units of organic material having a specific density less than that of water, said step of adhering the fibers being carried out by applying an organic adhesive coating to said flotation disc members and bringing said bark fibers into contact with said coating, said bark fibers functioning as a means to attract and hold excessive nutrient deposition in the form of colloidal wastes, single-celled bacteria, cytoplankton and the like and aquatic algae produced thereby while at the same time providing a safe habitat for minute animal organisms capable of feeding thereon in the form of algae predators and feeders in the form of crustacea, rotifers, snails, zooplankton and the like, and dispersing said self-contained bark fiber flotation units in an upper zone of said body of water adjacent to and beneath the surface thereof and in the path of likely growth and movement of algae and algae nutrients, said upper zone for dispersal of said bark fiber units being sufficiently shallow in depth to be relatively rich in dissolved oxygen as respects lower zones of said body of water.

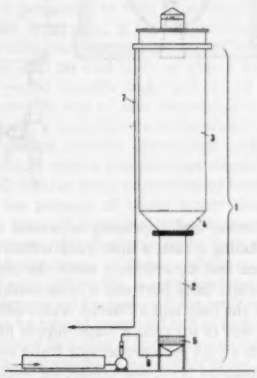


4,086,162

METHOD OF ADSORPTION BY ACTIVATED CHARCOAL IN A LOWER FLUIDIZED BED AND UPPER FIXED BED

Jacques Benzaria, 97, rue du Bas-Saut, 60230 Chambly, France

Continuation of Ser. No. 517,056, Oct. 22, 1974, abandoned.
This application Jun. 16, 1976, Ser. No. 696,261
Claims priority, application France, Oct. 22, 1973, 73 37630
Int. Cl.² B01D *35/00, 39/00*
U.S. Cl. 210—20 **4 Claims**



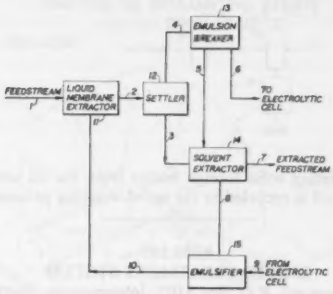
1. A process for adsorption of components of a fluid phase on beds of activated carbon comprising passing the fluid to be treated through a lower fluidized bed of activated carbon at a rate sufficient to create a fluidized bed, upwardly passing the fluid through a junction area and then upwardly through an upper fixed bed of activated carbon at a slower rate of speed in a ratio of not more than about 1:10 with respect to the rate of the lower bed, said difference in the rate of flow being used to maintain the lower bed in fluidized form and said upper bed in fixed form and said rate of flow being controlled by the ratio of the cross-section of the lower bed to the upper bed, said ratio being 1/4 to 1/10 and recovering the treated fluid.

4,086,163

METAL EXTRACTION BY COMBINED SOLVENT AND LM EXTRACTION

Robert P. Cahn, Millburn, and Norman N. Li, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Sep. 29, 1976, Ser. No. 727,845
Int. Cl.² B01D *13/00*
U.S. Cl. 210—22 D **16 Claims**



1. A process for removing a dissolved component from an aqueous feedstream comprising:

(a) contacting said feedstream with an emulsion having a continuous phase immiscible with the feedstream and permeable to said dissolved component, and a dispersed phase, for a period of time and at conditions sufficient for said emulsion to absorb a portion of said dissolved component ranging from 20 to 90 weight %;

(b) removing at least part of said emulsion from said feedstream which emulsion contains said portion of said dissolved component;

(c) demulsifying at least a portion of said removed emulsion into the continuous and dispersed phases;

(d) contacting the feedstream resultant from step (b) with a solvent immiscible with said feedstream and permeable to said dissolved component, said solvent comprising at least part of the continuous phase resultant from the demulsification step (c), whereby said solvent has a capacity to absorb a major amount of the remaining dissolved component.

4,086,164

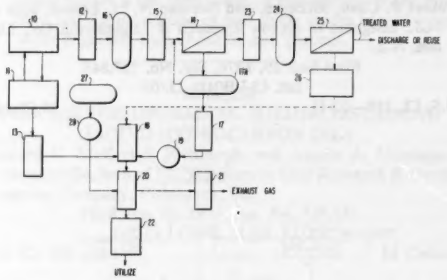
METHOD OF DISPOSING OF WASTE WATER CONTAINING EMULSIFIED OIL

Mitsuhiko Noda, and Kikuo Nomura, both of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 10, 1976, Ser. No. 665,480
Claims priority, application Japan, Mar. 10, 1975, 50-29208
Int. Cl.² C02C *5/04*
U.S. Cl. 210—46 **11 Claims**

1. A method of disposing of oil containing emulsified waste water from metal working processes which comprises concentrating an oil containing emulsified waste water, mixing the concentrate obtained at least with a filtration auxiliary which contains filtration dregs of solid foreign bodies resulting from the working of metals to form a substantially independently combustible mixture, and burning the resulting mixture, said

emulsified waste water remaining in an emulsified state after concentration, said filtration auxiliary comprising a substance



used in filtering solid foreign bodies from the oil when said emulsified oil is recycled in the metal working processes.

4,086,165

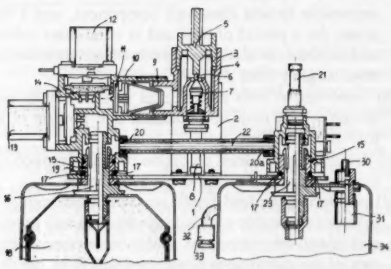
LIQUID-TREATMENT SYSTEM

Augusto Formenti, P.O. Box 4102, Johannesburg, South Africa

Continuation-in-part of Ser. No. 491,874, Jul. 25, 1974, abandoned. This application Dec. 8, 1976, Ser. No. 748,772

Int. Cl.[2] B01D *29/36;* **C02B** *1/16*

U.S. Cl. 210—104 **8 Claims**



1. A liquid-treatment system made of modular elements for treating liquids such as water comprising; a first tank having a liquid-treatment cartridge therein for treating all of a liquid received for treatment; a second tank constructed similarly to the first tank without a cartridge for receiving the liquid treated in said first tank; a modular liquid-control unit for controlling flow of liquid into said first tank to be treated and flow of liquid from said first tank to said second tank and outflow of treated liquid from said second tank comprising, two similar modular couplings symmetrically mounted and each removably connected to the interior of a corresponding one of said first tank and said second tank, a mounting element fixedly mounting said modular couplings relative to each other thereon for mounting and for removal of said liquid-control unit as an assembly with respect to the two tanks, mounting elements on said modular couplings for mounting thereof removably on the corresponding tanks, each modular coupling having two independent coaxial flow paths comprising an inner and an outer flow path, a removable connecting conduit connecting the outer flow paths of the modular couplings, a supply valve mounted on said mounting element connectable in use to a supply main for supplying liquid to be treated and having a valve element for turning on and off flow of liquid into said liquid-control unit, a flow-control device in series with said supply valve for controlling the flow of liquid from said supply valve at a substantially constant flow at a pressure tolerable by the liquid-treatment system in the presence of pressure variations in the supply main and for precluding water-hammering in the system, at least one electromagnetically-controlled valve closed when deenergized mounted on and upstream of the modular coupling mounted on said first tank and downstream of said flow-control device for supply of liquid therethrough to the inner flow path of said modular coupling on said first tank for flow through said liquid-treatment cartridge, a pair of similar microswitches on said fluid-control unit comprising a first microswitch for controlling application of an electrical signal to said electromagnetically-controlled valve for opening for allowing flow of liquid into said first tank in dependence upon the water level in said second tank to render said first microswitch effective to apply said signal when said liquid in said second tank is below said predetermined level; means for rendering the second of said microswitches effective to control the outflow of liquid from said second tank through the inner flow path of said second modular coupling; said second tank having one-way means above said predetermined level for venting it to the atmosphere; and one-way means on said second tank for allowing entry of filtered air thereinto as the level of said second tank varies downwardly.

4,086,166

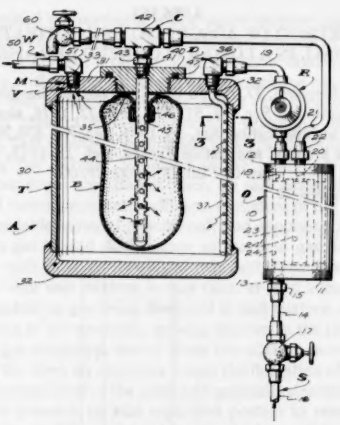
WATER FILTERING AND DISPENSING APPARATUS

Ernest Newell Martin, 1027 E. 5th St., Escondido, Calif. 92025

Continuation-in-part of Ser. No. 597,354, Jul. 21, 1975, abandoned. This application Mar. 28, 1977, Ser. No. 781,682

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—134 **6 Claims**



1. A water filtering and dispensing apparatus comprising a filter device including a case, a filter pack within the case and defining upstream and downstream sides thereon and in the case, a service water inlet port and a brine outlet port in the upstream side of the case and a filtered water delivery port in the downstream side of the case, a water supply line connected with and between a high pressure service water system and the inlet port, an elongated brine line connected with and extending from the brine outlet port and an elongate filtered water delivery line connected with and extending from the delivery line downstream from said device, a holding tank with an upstream brine inlet opening, a downstream brine outlet opening spaced from the brine inlet opening and a filtered water transfer opening spaced from said brine inlet and outlet openings; the end of the brine line remote from the device is connected with the brine inlet opening, an inflatable filtered water receiving bladder within the tank with its interior communicating with the transfer opening, means connecting said transfer opening with the delivery line between the device and the dispensing valve, a waste line connected with and extending downstream from the brine outlet openings, a pressure regula-

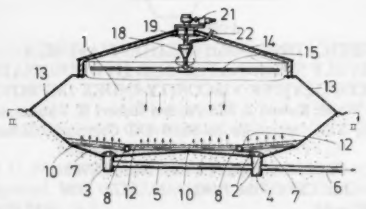
tor in the brine line between the device and the tank reducing the pressure on brine flowing into and through the tank below the pressure in service water system and in the delivery line when the dispensing valve is closed, flow control means downstream of the tank limiting the flow of brine into, through and from the tank to near the rate of flow of service water into the device and the corresponding rate of flow of brine and filtered water from the device when the dispensing valve is closed and at a rate below the rate of flow of brine into the tank and the rate of flow of filtered water from the apparatus when the dispensing valve is open and a normally open bladder actuated shut-off valve at the brine outlet opening and operated to close when the bladder is inflated in the tank by a predetermined full supply of filtered water whereby flow of service water into and filtered water and brine through and out of the apparatus is stopped until the dispensing valve is opened, said full supply of filtered water is depleted and said shut off valve is opened.

4,086,167

BIOFILTER

Esko Tapola; Matti Sten, and Onni Koistinen, all of Imatra, Finland, assignors to Enso-Gutzeit Osakeyhtio, Helsinki, Finland

Filed Jan. 10, 1977, Ser. No. 758,199
Int. Cl.² C02C *5/10*
U.S. Cl. 210—150 **3 Claims**



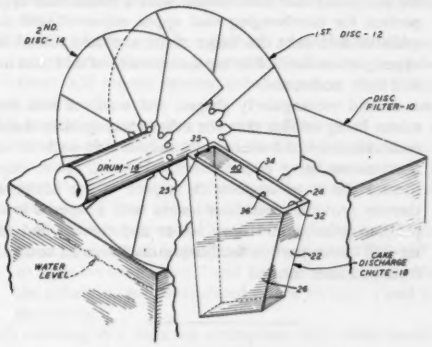
1. An improved biofilter for the treatment of waste water and gases comprising a depression formed in the ground, a layer of gravel permeable to both liquid and gas carried on the bottom of said depression, a bed of coniferous tree barking residue containing micro-organisms carried within said depression and supported on said layer of gravel for passing waste water to be treated therethrough, said bed of barking residue extending above the top of said depression in a heap having sloping side walls, a plurality of articles which minimally affect the micro-organism activity distributed within said bed of barking residue to reduce compactness thereof to render said bed of barking residue more permeable to liquid and gas so as to facilitate the passage of waste water therethrough, said articles being selected from the group consisting of pieces of plastic, pine cones, pieces of tree limbs with the bark thereof intact, and tubular pieces of paper roll cores, a plastic fabric lining said sloping side walls, a roof covering the top of said heap, means supported by said roof for uniformly distributing waste water to be treated upon said bed of barking residue, said distributing means including a spray pipe mounted in said roof for rotation in a substantially horizontal plane about a vertical axis of rotation, said spray pipe having a plurality of nozzles distributed therealong, a deflection plate associated with each nozzle, a tube having a plurality of holes therein connected with said spray tube to supply said waste water thereto, a feed cone surrounding a portion of said tube, and a pipe communicating with said feed cone for supplying waste material thereto for uniform distribution into said spray pipe, a pipe system of substantially radially extending perforated pipes embedded in said layer of gravel and located directly beneath said bed of barking residue for blowing gas containing oxygen against the flow of waste water through said bed, an exhaust valve carried by said roof by exhausting the gas blown by said pipe system which has passed through said bed of barking residue, a system of underdrain pipes located at the bottom of said depression below said pipe system embedded in said layer of gravel for collecting treated water which has traversed said bed of barking residue, and drain wells communicating with said underdrain pipes for draining said treated water.

4,086,168

DISC FILTER CHUTE LINER

Richard D. Moore, New Boston, N.H., assignor to Plastic Techniques, Inc., New Boston, N.H.

Filed Oct. 16, 1975, Ser. No. 622,870
Int. Cl.² B01D *33/22*
U.S. Cl. 210—330 **1 Claim**



1. A disc filter chute liner for lining a cake discharge chute, the cake discharge chute provided with a plurality of walls the open upper ends of which define a cake inlet and the open lower ends of which define a cake outlet and said walls having internal surfaces interconnecting said cake inlet and outlet and defining a passage through said cake discharge chute through which cake passes and said internal surfaces meeting in sharp corners and a portion of the cake passing through said cake discharge chute adhering to said internal surfaces of said walls and to said sharp corners, and said walls also provided with upper edges defining said cake inlet, comprising:

generally hollow liner means provided with a plurality of walls having open upper and lower ends and for being inserted in said cake discharge chute with said open upper and lower ends thereof being generally coincident with said cake inlet and outlet, respectively, of said cake discharge chute and with said walls thereof being disposed between said internal surfaces of said walls and said sharp corners of said cake discharge chute and said cake passing therethrough:

said liner means provided with a pair of opposed trapezoidally shaped side walls and a pair of opposed rectangularly shaped end walls, said side walls and end walls being formed integrally and provided with external surfaces having smooth external transitional corners therebetween and said external surfaces and external transitional corners being generally complementary in configuration to said internal surfaces and sharp corners of said walls of said cake discharge chute, and said side and end walls of said liner means provided with upper edges and lower edges;

said side and end walls of said liner means provided with internal surfaces having smooth transitional corners therebetween and which internal surfaces define a passage through said liner means through which said cake passes upon said liner means being inserted in said cake discharge chute;

said liner means made of a predetermined material providing said internal surfaces and said smooth internal transitional corners of said opposed side and end walls thereof with smooth and slick internal surfaces with respect to said cake and said smooth and slick internal surfaces and corners for preventing said cake from adhering thereto and

thereby also for preventing said cake from adhering to said internal surfaces and sharp corners of said walls of said cake discharge chute;

said liner means further provided with a plurality of generally trapezoidally shaped upper section portions formed integrally with each other and with said upper edges of said opposed side walls and one of said end walls and with a generally trapezoidally shaped upper portion of said other end wall, and said trapezoidally shaped upper sections being formed at a predetermined outwardly flaring angle with respect to said side walls and said one end wall and defining said open upper end of said liner means and for providing said liner means with a funnel-like upper portion for overhanging said upper edges of said side walls of said cake discharge chute and said funnel-like upper portion for facilitating the entrance of said cake into said liner means; and

one of said rectangularly shaped end walls of said liner means being smaller than the other rectangularly shaped end wall and said trapezoidally shaped side walls of said liner means being disposed such that said lower edges thereof are at an angle with respect to the horizontal thereby providing said liner means with a tapered lower portion defining said open lower end thereof and said tapered lower portion facilitating discharge of said cake from said liner means.

4,086,169

LAMELLA SEPARATOR FOR SEDIMENTING (GRAVITY SEPARATING)

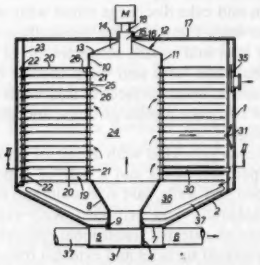
Hans Petter Skarheim, Hygge, and Torbjorn Damhaug, Oslo, both of Norway, assignors to Thune-Eureka A/S, Tranby, Norway

Filed Sep. 17, 1976, Ser. No. 724,219

Claims priority, application Norway, Sep. 18, 1975, 753186; Aug. 30, 1976, 762978

Int. Cl.² B01D *21/24*

U.S. Cl. 210—519 **14 Claims**



1. Lamella separator for sedimenting, characterized in that it comprises a lamella stack disposed on the vertical axis in a container, means mounting the lamella stack for rotation about its vertical axis in the container, said lamella stack havng horizontally-disposed, mutually spaced lamellae, and having a central through opening, at least one sludge-removing device for each lamella, a device for effecting a relative movement between each lamella and its associated sludge-removing device, an intake and an outlet in the container for the fluid to be treated, as well as an outlet in the container for the sludge that has been separaed out, and a radial wall in the annular space between the wall of the container and the lamella stack, in front of the scraper with regard to the direction of rotation of the lamellae.

4,086,170

PROCESS FOR PREPARING OVERBASED CALCIUM SULFONATES

Georges De Clippeleir, and André Vanderlinden, both of Brussels, Belgium, assignors to Labofina S. A., Brussels, Belgium

Continuation-in-part of Ser. No. 758,155, Jan. 10, 1977, abandoned. This application Feb. 1, 1977, Ser. No. 764,691

Claims priority, application Belgium, Oct. 8, 1976, 171325

Int. Cl.² C10M *1/40, 3/34, 5/22, 7/38*

U.S. Cl. 252—33 **12 Claims**

1. A process for preparing overbased calcium sulfonates having a high degree of alkalinity, which comprises the steps of:

(a) reacting a solution of at least one alkyl benzene sulfonic acid the alkyl group of which has an average molecular weight of about 250 to about 2000 in an organic solvent comprising a mineral oil with an excess of a calcium oxide, having a medium reactivity towards water, which is characterized by a total reaction time of about 8 to about 25 minutes and a ratio of temperature rise after 30 seconds of hydration to total temperature rise of about 15 to about 45%, to form a reaction mixture

(b) reacting said reaction mixture with gaseous carbon dioxide, and

(c) filtering said reaction mixture to obtain a concentrated oily solution containing overbased calcium sulfonate.

4,086,171

LUBRICATING COMPOSITION HAVING A SELECTIVELY SULFONATED AND HYDROGENATED BLOCK COPOLYMER VISCOSITY-INDEX IMPROVER

Donald L. Wood; Robert J. Moore, and Robert B. Rhodes, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed May 23, 1977, Ser. No. 799,901

Int. Cl.² C10M *1/40, 3/34, 5/22, 7/38*

U.S. Cl. 252—33 **10 Claims**

1. A lubricating composition comprising a major proportion of a lubricating oil and between about 0.1 and about 15.0 weight percent of a viscosity index improver having the general configuration A-B wherein:

a. each A is a sulfonated monoalkenyl arene polymer block having a number average molecular weight of between about 25,000 and about 55,000;

b. each B is a hydrogenated polymer block, said block B, prior to hydrogenation, being a conjugated diene block selected from the group consisting of butadiene blocks, isoprene blocks, and butadiene/isoprene blocks, at least 90 percent of the olefinic unsaturation of block B being reduced by hydrogenation of the block copolymer, said block B having a number average molecular weight between about 20,000 and about 150,000;

c. the weight ratio of block A to block B is between about 0.45:1 and about 0.8:1; and

d. the sulfur content of the block copolymer is more than about 0.1 percent by weight and less than 1.0 percent by weight.

5. A composition according to claim 1 wherein the polymer block A contains sulfonate radicals selected from the group consisting of —SO_3 alkaline earth metal, —SO_3H, —SO_3 alkali metal, —SO_3NH_4, and SO_3 amino.

4,086,172

LUBRICATING OIL ADDITIVE COMPOSITION

Warren Lowe, El Cerrito, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1976, Ser. No. 672,806

Int. Cl.² C09K *15/20;* C10M *1/12, 1/20, 1/34*

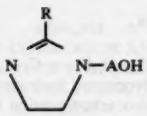
U.S. Cl. 252—47.5 **11 Claims**

1. An additive composition for use in crankcase lubricating oils comprising:

(1) an oil-soluble antioxidant selected from aromatic or alkyl

sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters, and sulfurized esterolefins, and

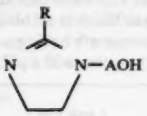
(2) an oil-soluble hydroxy amine of the formula:



wherein A is a C_2–C_{10} alkylene, and R is C_1–C_{30} alkyl.

3. A lubricating oil composition comprising a major amount of an oil of lubricating viscosity and an antioxidant amount of the composition of claim 1.

11. A method for inhibiting the oxidation of a lubricating oil which comprises adding to said lubricating oil from 0.25 to 10 percent weight of (1) an oil-soluble antioxidant selected from aromatic or alkyl sulfides and polysulfides, sulfurized olefins, sulfurized carboxylic acid esters and sulfurized ester-olefins, and from 0.001 to 5% weight of (2) an oil-soluble hydroxy amine of the formula



wherein A is a C_2–C_{10} alkylene, and R is C_1–C_{30} alkyl.

4,086,173

LUBRICANT COMPOSITIONS CONTAINING MULTIFUNCTIONAL ADDITIVES

John C. Nnadi, Glassboro, and Margaret H. McIntyre, West Deptford, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 5, 1975, Ser. No. 584,241

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 A **16 Claims**

1. A lubricant composition containing a dispersancy improving and antirust amount of the acidic product obtained by reacting an alkenylsuccinic anhydride having from about 20 to about 500 carbon atoms in the alkenyl group with a member of the group consisting of (1) a bis-alkenyl succinimide, having up to 500 carbon atoms in the alkylene group, of an alkylene polyamide and (2) a glycol ester, amino glycol ester, imidoester, amidoester or oxazoline ester of an alkenylsuccinic anhydride having from about 20 to about 500 carbon atoms in the alkylene group.

4,086,174

COBALT MODIFIED ACICULAR γ FERRIC OXIDE AND PROCESS FOR PREPARING THE SAME

Leonard N. Bennetch, Bethlehem, Pa., assignor to Pfizer Inc., New York, N.Y.

Continuation of Ser. No. 648,670, Jan. 13, 1976, abandoned, which is a continuation of Ser. No. 467,459, May 6, 1974, abandoned. This application Jul. 12, 1977, Ser. No. 815,076

Int. Cl.[2] C01G *49/06;* **G11B** *5/70*

U.S. Cl. 252—62.56 **8 Claims**

1. Synthetic cobalt modified acicular gamma ferric oxide wherein the cobalt is present in an amount of at least about ¼ atomic percent cobalt, based on the iron content, which when incorporated with vinyl copolymer recording binder at a level of 75% by weight provides a polyethylene terephthalate based magnetic recording member which exhibits a magnetic stability coefficient of from about 4,000 to about 10,000.

3. A process for the manufacture of synthetic acicular gamma ferric oxide containing at least about ¼ atomic percent cobalt, based on the iron content, which when incorporated with recording binder at a level of 75% by weight provides a magnetic recording member which exhibits a magnetic stability coefficient of from about 4000 to about 10,000 comprising the steps of:

(a) introducing aqueous alkali into aqueous ferrous chloride containing from about 0.25 to 0.7 pound ferrous chloride per gallon, said alkali being added at the rate of from about 0.03 to 0.2 equivalents per minute per mole dissolved ferrous chloride while maintaining the temperature at about 60°–90° F.; continuing said addition until sufficient alkali has been added to precipitate from about 20 to 85% of the iron as ferrous hydroxide;

(b) introducing oxygen-containing gas into said aqueous mixture until the pH is between about 2.6 and 4.1 and the ferrous hydroxide precipitate is oxidized to the lepidocrocite form;

(c) adding water-soluble cobalt salt to the resulting lepidocrocite seed slurry in an amount equivalent to at least about 0.25 atomic percent cobalt based on the total iron introduced;

(d) maintaining said slurry at about 80°–160° F. and a pH between about 2.6 and 4.1 while simultaneously and continuously introducing alkali and oxygen-containing gas until the iron content is substantially completely precipitated in the form of lepidocrocite;

(e) and adding aqueous alkali while introducing oxygen-containing gas into said aqueous mixture at about 80°–160° F. to a pH between about 7 and 9.5 until substantially all of the cobalt ion has precipitated on the surface of said lepidocrocite;

(f) reducing in a reducing atmosphere said cobalt modified lepidocrocite to cobalt modified ferroso-ferric oxide at a temperature of from about 650° to 800° F., and subsequently oxidizing in an oxidizing atmosphere to cobalt modified acicular gamma ferric oxide.

4,086,175

ACTIVATED BLEACHING PROCESS AND COMPOSITIONS THEREFOR

Louis N. Kravetz, and Hans E. Kubitschek, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 656,456, Feb. 9, 1976, abandoned. This application Nov. 22, 1976, Ser. No. 743,729

Int. Cl.[2] C11D *7/56*

U.S. Cl. 252—99 **29 Claims**

1. A process for activating a peroxide-based bleach which comprises conjointly incorporating into an aqueous medium effective amounts of (a) a peroxide-based bleach, (b) a peroxide-activating amount of cyanamide or a Group IA or Group IIA metal cyanamide, (c) a magnesium compound and (d) a buffering agent to maintain the aqueous medium under alkaline conditions.

4,086,176

SOLUTIONS FOR CHEMICALLY POLISHING SURFACES OF COPPER AND ITS ALLOYS

Harry Ericson, Vastra Frolunda, and Carl Otto Fredriksson, Goteborg, both of Sweden, assignors to Nordnero AB, Kungalv, Sweden

Filed Dec. 8, 1975, Ser. No. 638,698

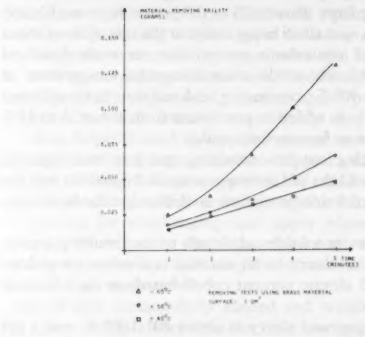
Claims priority, application Sweden, Dec. 13, 1974, 7415649

Int. Cl.[2] C23F *3/00;* **C23G** *1/06;* **C09K** *13/06;* **C11D** *7/08*

U.S. Cl. 252—100 **2 Claims**

1. A solution for chemically polishing surfaces of copper and its alloys which contains mono- and/or di-substituted alkali

metal salts of oxalic acid at a pH value of 3.0 – 5.0 in combination with hydrogen peroxide, at least one stabilizer to stabilize



the hydrogen peroxide, said stabilizer being selected from the group consisting of an aliphatic fatty amine of the formula

$$C_{18}H_{37}-N\begin{matrix}(C_2H_4O)_{12}H\\(C_2H_4O)_{12}H\end{matrix}$$

and benzotriazole, and at least one brightener consisting of 0.1 – 5.0 g/l sodium lignin sulphonate.

4,086,177

ACTIVATED BLEACHING PROCESS AND COMPOSITIONS THEREFOR

Hans E. Kubitschek, and Louis Kravetz, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Feb. 9, 1976, Ser. No. 656,457
Int. Cl.[2] C11D *7/54*
U.S. Cl. 252—102 **25 Claims**

1. A process for activating a peroxide-based bleach which comprises conjointly incorporating into an aqueous medium effective amounts of (a) a peroxide-based bleach, (b) a peroxide-activating amount of a Group IA or IIA metal cyanamide and (c) a buffering agent to maintain the aqueous medium under alkaline conditions.

9. A stable concentrated bleaching composition consisting essentially of a peroxide-based bleach and a peroxide-activating amount of a Group IA or IIA metal cyanamide as an activator therefore.

4,086,178

GLASS CLEANING FORMULATION

David Richard William Walker, Northwich, England, assignor to Rolls-Royce Motors Limited, Crewe, England

Filed May 27, 1975, Ser. No. 580,828
Claims priority, application United Kingdom, Aug. 6, 1974, 34529/74; Aug. 9, 1974, 35118/74
Int. Cl.[2] C11D *1/24, 1/83, 3/24*
U.S. Cl. 252—143 **12 Claims**

1. A stable glass cleaning fluid concentrate which, when diluted, does not attack rubber seals and surrounding paint while, in use, and is devoid of smearing and hazing of automobile windshields under night driving conditions, said concentrate consisting essentially of:

(a) an anionic surface active agent selected from the group consisting of:
  (i) an anionic sulphated alkyl phenoxy polyethoxy ethanol; and
  (ii) an anionic di-sodium salt of the half ester of sulphosuccinic acid;
(b) a fluorinated hydrocarbon surface active agent selected from the group consisting of:
  (i) an anionic fluorinated hydrocarbon surface active agent with the fluorinated hydrocarbon portion having a branched chain structure with aliphatic per-fluorocarbon groups at one end of the molecule;
  (ii) a non-ionic fluorinated hydrocarbon surface active agent with the fluorinated hydrocarbon portion exhibiting a branched structure and represented by the formula:

$$R_f(OCH_2CH_2)_nOR_f$$

  wherein R_f is C_8F_{15}, $C_{10}F_{19}$ or $C_{12}F_{23}$ and n is 10–30;
  (iii) a non-ionic fluorinated hydrocarbon with a branched fluorinated hydrocarbon portion having the formula:

$$R_f(OCH_2CH_2)_mOR$$

  wherein R is lower alkyl and m is 2–20; and
  (iv) an anionic fluorinated hydrocarbon surface active agent wherein the fluoronated hydrocarbon portion exhibits a straight chain structure and has aliphatic per-fluorocarbon groups at one end of the chain;
(c) citric acid or sodium citrate
(d) components (a), (b) and (c) blended together in an alcohol carrier

wherein the proportion, in parts by weight, of (a) to (b) is in the ratio of 3.5:1 to 13.7:1 and the ratio, in parts by weight, of component (c) to the over-all blend is about 1:3.365, the cleaning fluid concentrate having a surface tension range of about 20–25 dynes/cm and a pH of about 3.0–4.0.

4,086,179

IMPROVED CLEANING SOLVENT CONTAINING NON-AZEOTROPIC MIXTURES OF 1,1,1-TRICHLOROETHANE AND N-PROPANOL

Alvin F. Schneider, Edison, N.J., assignor to Alpha Metals, Inc., Jersey City, N.J.

Filed Dec. 10, 1976, Ser. No. 749,274
Int. Cl.[2] C23G *5/02;* C11D *7/50, 7/30*
U.S. Cl. 252—171 **2 Claims**

1. A cleaning composition for removing polar and non-polar contaminants from electronic equipment in vapor cleaning processes consisting essentially of a major amount of stabilized 1,1,1-trichloroethane and normal propanol, said normal propanol being present in an amount of about 4.0 weight percent such that such composition does not exhibit a flash point, and has a relatively narrow boiling range, said amount being less than the amount of said normal propanol in the azeotropic composition of said normal propanol with said 1,1,1-trichloroethane and such that said composition can be safely employed in said vapor cleaning processes.

2. A process for removing both polar and non-polar contaminants from electronic equipment which comprises contacting said electronic equipment with a solvent consisting essentially of a major amount of stabilized 1,1,1-trichloroethane and normal propanol, said normal propanol being present in an amount of about 4.0 weight percent such that said composition does not exhibit a flash point and has a relatively narrow boiling range, said amount being less than the amount of said normal propanol in the azeotropic composition of said normal propanol and said 1,1,1-trichloroethane, said contacting being carried out with said solvent at its boiling point so that said solvent is present in the vapor phase.

4,086,180

CONSTANT BOILING ADMIXTURES

William Milton Hutchinson, deceased, late of Bartlesville, Okla., and by Florence M. Hutchinson, executrix, Claremore, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 690,807, May 27, 1976, Pat. No. 4,039,465, which is a division of Ser. No. 602,353, Aug. 6, 1975, Pat. No. 4,024,086. This application Mar. 31, 1977, Ser. No. 783,244
Int. Cl.[2] C11D *7/50, 7/30;* C23G *5/02*
U.S. Cl. 252—171 **7 Claims**

1. A substantially constant boiling admixture of (A) 1,1-

difluoro-1,2-dichloroethane and (B) a member selected from the group consisting of methanol and ethanol.

4,086,181

CONTROL OF CORROSION AND SCALE IN CIRCULATING WATER SYSTEMS BY MEANS OF PARTIAL ESTERS OF POLYFUNCTIONAL ORGANIC ACIDS

Tzeng Jiueq Suen, New Canaan; Arthur James Begala, Jr., Fairfield, and Martin Grayson, Cos Cob, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 610,808, Sep. 5, 1975, Pat. No. 4,020,000, which is a division of Ser. No. 456,119, Mar. 29, 1974, Pat. No. 3,974,083. This application Feb. 14, 1977, Ser. No. 768,249

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.² C02B *5/06*

U.S. Cl. 252—180 **1 Claim**

1. An additive composition for inhibiting corrosion and scale on ferrous metal parts of a circulating water system by addition of said additive to said water in inhibiting amounts, said composition consisting essentially of a mixture of: a) the partial ester condensation product of an alcohol having the formula

$$R(O—CH_2CH_2)_mOH$$

wherein

R is hydrocarbon having 8 to 20 carbon atoms and *m* is 2 to 4, with an acid selected from citric, malic, tartaric, succinic, adipic, phthalic and maleic acids, wherein one carboxyl group in said acid is unesterified and; b) from more than one to about two parts by wt. of a light hydrocarbon oil or vegetable oil per part of said condensation product and sufficient amount of a surfactant for dispersing said oil in water.

4,086,182

RUST TRANSFORMING COMPOSITION

Erich Hengelhaupt, and Lothar Peier, both of Bern, Switzerland, assignors to Noverox AG., Zug, Switzerland

Filed Nov. 23, 1976, Ser. No. 744,426

Claims priority, application Switzerland, Nov. 27, 1975, 15407/75

Int. Cl.² C23F *7/00*

U.S. Cl. 252—182 **16 Claims**

1. A composition for converting a surface film of iron oxide on an iron body into a corrosion resistant film containing complexed compounds of iron, said composition comprising an aqueous dispersion or emulsion of a synthetic binding agent together with at least one polymeric esterification product of an aromatic oxycarboxylic acid having phenolic hydroxyl groups with a substance selected from the group consisting of acid anhydrides and substituted acid anhydrides.

4,086,183

HEAT STABLE COLORED CHEMILUMINESCENT COMPOSITIONS

Alfred F. Tatyrek, 27 Orchard Rd., Maplewood, N.J. 07040

Filed Jun. 24, 1976, Ser. No. 699,570

Int. Cl.² C09K *3/00*

U.S. Cl. 427—157 **23 Claims**

1. An improved process of generating visible light of yellow, orange, or red color from the blue-green visible light produced by the reaction of a tetraaminoethylene with oxygen wherein the improvement comprises first uniformly applying a fluorescent dye on a substrate and then uniformly applying the tetraaminoethylene on the substrate.

4,086,184

REACTIVATION OF DEACTIVATED HYDROCARBON CONVERSION CATALYST BY ULTRASONIC INSONATION

H. Clarke Henry, Sarnia, and Ramaswami Ranganathan, Saskatoon, both of Canada, assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed May 2, 1973, Ser. No. 356,570

Int. Cl.² B01J *29/38, 23/94, 23/96, 23/20*

U.S. Cl. 252—414 **21 Claims**

1. A method for reactivating a permanently deactivated hydrocarbon conversion catalyst which comprises:

(a) oxidizing the catalyst by exposing said catalyst to air at elevated temperatures; and (b) immersing said oxidized catalyst resulting from step (a) in a liquid medium which does not react with the catalyst and applying ultrasonic energy thereto.

20. In a hydrocracking process in which a petroleum feedstock is cracked in the presence of a catalyst on an amorphous silica/alumina support and said catalyst is regenerated by calcination, which catalyst is subject to permanent deactivation by deposits of carbonaceous material and metal oxide contaminants which cannot be removed by regeneration, the improvement which comprises reactivating the permanently deactivated catalyst by (a) oxidizing said carbonaceous material off the catalyst by exposing said catalyst to air at elevated temperatures and (b) immersing said oxidized catalyst resulting from step (a) in a liquid medium which does not react with the catalyst and agitating said medium by ultrasonic energy having a frequency of from about 18 to about 500 kHz.

4,086,185

PROCESS FOR ACTIVATING CATALYST FOR POLYMERIZATION OF PROPYLENE BEFORE POLYMERIZATION

Isoo Shirai, Chibashi; Takeshi Suzuki, and Tsutomu Takahashi, both of Ichiharashi, all of Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Mar. 11, 1976, Ser. No. 666,107

Claims priority, application Japan, Mar. 11, 1975, 50-29245

Int. Cl.² C08F *4/64*

U.S. Cl. 252—429 B **4 Claims**

1. The method which comprises

(I) forming a delta-type titanium trichloride composition by

(A) reacting a beta-type titanium trichloride containing $AlCl_3$, with

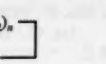
(B) a complexing agent selected from the group consisting of

(1) a dialkyl ether represented by the general formula R—O—R′ wherein R and R′ are each an alkyl group having 1 – 10 carbon atoms,

(2) a polyethylene glycol diakylether represented by the general formula R—O—$(CH_2CH_2O)_n$—R′ wherein R and R′ are each an alkyl group having 1 – 4 carbon atoms, and *n* is an integer of 1 – 4,

(3) a dialkyl thioether represented by the general formula R—S—R′ wherein R and R′ are each an alkyl having 1 – 10 carbon atoms,

(4) an alicylcic organic ether represented by the general formula



where *n* is an integer of 3–5, or

(5) an organic ester represented by the general formula RCOOR′, wherein R and R′ are each alkyl having 1 – 10 carbon atoms, or

(C) a complex compound consisting of said complexing agent and titanium tetrachloride, and

(D) grinding the resulting deltatype titanium chloride composition,

(II) forming a catalyst dispersion by mixing said ground delta-

type titanium trichloride composition with an alkyl aluminum chloride having the general formula R_nAlCl_{3-n}, wherein R is an alkyl having 1 - 4 carbon atoms and *n* is an integer of 1 - 2,

(III) activating said catalyst dispersion for the polymerization of propylene in advance of the polymerization which comprises contacting said catalyst dispersion, in an inert solvent, with propylene containing 1% or less by volume of hydrogen while said catalyst dispersion is maintained at 10° - 50° C, said propylene being fed into contact with said catalyst dispersion at a rate of 0.02 - 1.0 parts by weight per hour per part of delta-type -titanium trichloride composition and to such an extent that the amount of absorbed propylene is 0.5 - 5 times the weight of said delta-type titanium trichloride solution.

4,086,186

CRYSTALLINE ZEOLITE ZSM-34 AND METHOD OF PREPARING THE SAME

Mae K. Rubin, Bala Cynwyd, Pa.; Edward J. Rosinski, Pedricktown, and Charles J. Plank, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,771

Int. Cl.[2] C01B *33/28;* B01J *29/06, 29/28*

U.S. Cl. 252—430 **12 Claims**

1. A crystalline aluminosilicate zeolite having a composition, as synthesized and in anhydrous form, in terms of mole ratios of oxides as follows:

$(0.5\text{–}1.3)R_2O$: (0–0.15 Na_2O) : (0.10–0.50) K_2O : Al_2O_3 : X SiO_2

where R is the organic nitrogen-containing cation derived from choline and X is 8 to 50, said zeolite being characterized by:

(1) an X-ray powder diffraction pattern set forth in Table 1 of the specification; and

(2) the capability, after calcination at 1000° F for at least a time to remove the organic cation, of sorbing at least 9.5 weight percent of n-hexane at ambient temperature and a n-hexane pressure of 20 mm.

9. A method of preparing a crystalline aluminosilicate zeolite as defined in claim 1 which comprises preparing a mixture containing sodium oxide, potassium oxide, silica, alumina, a choline compound and water and having a composition in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3 — 10–70
OH^-/SiO_2 — .3–1.0
H_2O/OH^- — 20–100
K_2O/M_2O — 0.1–1.0
$R^+/R^+ + M^+$ — 0.1–0.8

where R^+ is choline and M is sodium + potassium; maintaining the mixture at a temperature of between about 80° and about 175° C until the crystals of said aluminosilicate zeolite are formed and separating and recovering said crystals.

4,086,187

ATTRITION RESISTANT ZEOLITIC CATALYST

John Lim, Anaheim, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Filed Jun. 17, 1976, Ser. No. 696,889

Int. Cl.[2] B01J *29/06*

U.S. Cl. 252—455 Z **11 Claims**

1. A water slurry consisting essentially of a mixture of a zeolite of the faujasite type having a Na content, expressed as Na_2O_3, of less than about 5% by weight of the zeolite, a kaolin clay, alumina in the form of pseudoboehmite and ammonium polysilicate.

5. A spray-dried cracking catalyst produced by spray drying a water slurry of a mixture of a zeolite of the faujasite type having a Na content, expressed as Na_2O, of less than about 5% by weight of the zeolite, a kaolin clay, pseudoboehmite and ammonium polysilicate.

4,086,188

CATALYST FOR ALDOL CONDENSATIONS

Walter Thomas Reichle, Millington, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 657,568, Feb. 12, 1976, abandoned. This application Nov. 29, 1976, Ser. No. 745,809

Int. Cl.[2] B01J *21/04, 21/10, 23/02, 23/04*

U.S. Cl. 252—463 **23 Claims**

1. Catalyst prepared by the steps of:

(a) interacting stoichiometric amounts of a water-soluble salt of a metal of Group II of the Deming Periodic Table and a water-soluble aluminum salt with a stoichiometric amount of an alkali metal or alkaline earth metal, water-soluble hydroxide in water to precipitate a water-insoluble slurry of mixed hydroxides, with the proviso that the ratio of gram atoms of Group II metal to aluminum metal is in the range of about 0.02 to about 0.3;

(b) washing the slurry from step (a) with water until substantially free of water-soluble salt;

(c) contacting the washed slurry from step (b) with a dilute aqueous solution of a lithium or a zinc salt at ambient temperature; and

(d) recovering and drying the product of step (c) at a temperature below about 400° C.

4,086,189

RESISTIVE ELEMENT HAVING VOLTAGE NON-LINEARITY AND METHOD OF MAKING SAME

Tetsuya Honda, Amagasaki; Kiyoshi Yagi, Takatsuki; Seiji Shibata, Kobe, and Kazuo Yamaguchi, Osaka, all of Japan, assignors to Otowa Electric Company, Ltd., Japan

Filed Sep. 10, 1976, Ser. No. 722,006

Claims priority, application Japan, Nov. 14, 1975, 50-137520

Int. Cl.[2] H01B *1/08*

U.S. Cl. 252—519 **3 Claims**

1. A resistive element having a high non-linearity and a low ΔV consisting essentially of a sintered body of zinc oxide and cobalt, strontium, barium, yttrium and magnesium in the proportions of 0.2 to 5.0 mol%, 0.2 to 2.0 mol%, 0.05 to 3.0 mol%, 0.05 to 10.0 mol% and 0.05 to 12.0 mol%, respectively, when calculated in the form of oxides, CoO, SrO, BaO, Y_2O_3 and MgO, respectively.

4,086,190

PROCESS FOR THE PRODUCTION OF SILICIC EPOXY POLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 678,196, Apr. 19, 1976, which is a continuation-in-part of Ser. No. 612,844, Sep. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 262,485, Jun. 14, 1972, abandoned. This application Dec. 20, 1976, Ser. No. 752,425

Int. Cl.[2] C08F *283/12*

U.S. Cl. 260—2 S **15 Claims**

1. The process for the production of silicic epoxy polymers by the following steps:

(a) admixing 2 parts by weight of a silicoformic acid and hydrated silica mixture with 2 to 3 parts by weight of an organic epoxy compound having at least one epoxy group;

(b) mixing therewith a catalytic amount of a catalyst selected from the group consisting of Lewis acids, organic amine compounds and polyamine resins;

(c) agitating the mixture until the resulting chemical reaction is complete.

4,086,191

PARTICULATE EXPANDABLE STYRENE POLYMERS FOR THE MANUFACTURE OF FOAMS

Klaus Hinselmann, Mutterstadt; Klaus Penzien, Frankenthal; Rupert Schick, Ludwigshafen; Manfred Walter, Speyer; Heinz Weber, Gruenstadt, and Heinrich Wirth, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 2, 1975, Ser. No. 618,931

Claims priority, application Germany, Oct. 11, 1974, 2448476; Oct. 15, 1974, 2448956; Jan. 17, 1975, 2501680

Int. Cl.[2] C08J *9/20, 9/22*

U.S. Cl. 260—2.5 B 6 Claims

1. A process for the manufacture of expandable styrene polymers containing from 0.0001 to 0.2 percent by weight, based on the styrene polymer, of a nonhomogeneously distributed nucleating agent for expandable polystyrene which comprises: treating expandable polystyrene particles at a temperature above their softening point with organic bromine nucleating compounds which contain at least three bromine atoms per molecule bonded to an aliphatic or cycloaliphatic structure and limiting the time available for the diffusion of the bromine compound into the expandable polystyrene particles such that said bromine compound is only present in a thin peripheral zone of the particles whereas the interior of said particles is free from the bromine compound, and whereby after foaming the expandable polystyrene particles, said foamed particles show a coarse cellular structure of from about 4 to 7 cells/mm in the interior while the thin peripheral zone has a fine cellular structure which is from about 0.1 to 3 mm thick, said peripheral zone having a negligible thickness compared to the total cross-sectional area of the foamed particle.

4,086,192

OLEFIN POLYMER COMPOSITION HAVING REDUCED FLAME PROPAGATION CHARACTERISTICS

Charles F. Raley, Jr., Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 168,756, Aug. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 53,332, Jul. 8, 1970, abandoned. This application Aug. 28, 1975, Ser. No. 608,593

Int. Cl.[2] C08J *9/10*

U.S. Cl. 260—2.5 FP 28 Claims

1. In an olefin polymer composition containing a halogenated organic moiety, the olefin polymer being selected from the group consisting of homopolymers and copolymers of aliphatic hydrocarbon monoolefins having no more than 12 carbon atoms, and substituted α-monoolefins wherein the substituent is carboxylic acid, alkyl or haloalkyl ester of carboxylic acid wherein alkyl or haloalkyl has from 1 to 12 carbon atoms or carboxylate having from 1 to 12 carbon atoms; the improvement which comprises the olefin polymer composition and elemental phosphorous having a specific gravity greater than 2.0 in an amount effective to reduce the propensity of the olefin polymer composition to propagate combustion after removal of a small scale ignition source provided that the atomic ratio of the phosphorus to halogen is from about 4:1 to about 1:6.

4,086,193

MICROPOROUS SHEETS AND A PROCESS FOR MAKING THEM

Artur Reischl, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 29, 1974, Ser. No. 501,575

Claims priority, application Germany, Sep. 7, 1973, 2345256

Int. Cl.[2] C08G *18/14*

U.S. Cl. 260—2.5 AY 14 Claims

1. A microporous sheet prepared by coagulation of a solution containing a non-ionic polyurethane in a polar solvent therefor mixed with an aqueous dispersion of a cationic polyurethane and an anionic polyurethane with a non-solvent for said non-ionic polyurethane.

2. A microporous sheet prepared by coagulation of a solution containing a non-ionic polyurethane in a polar solvent therefor mixed with an aqueous dispersion of either a cationic polyurethane or an anionic polyurethane with a non-solvent for the polyurethane, said aqueous dispersion being sedimenting and redispersible, having a particle size of 0.8 to 100 microns, and being insoluble in boiling dimethylformamide.

4,086,194

POLYURETHANE FOAM CONTAINING A FLAME RETARDANT

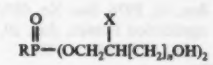
Siegfried Altscher, Monsey, and Jagadish C. Goswami, New City, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 492,562, Jul. 29, 1974, Pat. No. 3,939,227. This application Oct. 6, 1975, Ser. No. 619,769

Int. Cl.[2] C08J *9/00*

U.S. Cl. 260—2.5 AJ 6 Claims

1. A polyurethane foam containing an effective amount for flame retardancy of the foam formed therefrom of a compound of the formula



where *n* is an integer from 1 to 8, R is selected from the group consisting of C_1–C_{20} alkyl, aryl and halo-substituted C_1–C_{20} alkyl and aryl and X is halogen.

4,086,195

BITUMEN FILLED POLYESTER FOAMS

Walter R. Knox, Town & Country; James C. Hill, Chesterfield; Lawrence J. Hughes, St. Charles, and Paul W. Foerst, Florissant, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 2, 1977, Ser. No. 773,720

Int. Cl.[2] C08J *9/02*

U.S. Cl. 260—2.5 N 17 Claims

1. A process for the production of foamed polymeric material which comprises forming a solution of a bitumen having a softening point of at least about 80° C. in a cyclic diacid anhydride at a temperature above the softening point of the bitumen and initiating an exothermic reaction by mixing the solution with a monoterminal epoxide and a poly-terminal epoxide in the presence of a blowing agent; the ratio of total epoxy groups to cyclic diacid anhydride groups being from 1:1 to 2:1 and the epoxy-equivalent mole ratio of polyepoxide to monoepoxide being from 0.01 to 1.0: the temperature of the bitumen solution upon mixing being such that the blowing agent is activated and a foam is generated and such that the viscosity of the mixture is not so low that the gas generating the foam is able to escape from the mixture before the foam has solidified to such an extent that no foaming occurs; the amount of bitumen used being from about 70% to about 95% by weight of the total weight of the foamed polymeric material; and allowing the reaction to proceed, without cooling, until the exothermic reaction has ceased.

4,086,196

PARATHYROID HORMONE

Geoffrey William Tregear, Hawthorn, Australia, assignor to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Mar. 28, 1975, Ser. No. 563,173

Int. Cl.[2] C07C *103/52;* C08L *37/00*

U.S. Cl. 260—112.5 R 2 Claims

1. A synthetic polypeptide of the formula

H-X-Val-Ser-Glu-Ile-Gln-Leu-Met-His-Asn-Leu-Gly-Lys-

His-Leu-Asn-Ser-Met-Glu-Arg-Val-Glu-Trp-Leu-Arg-Lys-QOH

where
X is Ser or Ala and
Q is
-Lys-
-Lys-Leu-
-Lys-Leu-Gln-
-Lys-Leu-Gln-Asp-
-Lys-Leu-Gln-Asp-Val-
-Lys-Leu-Gln-Asp-Val-His-
-Lys-Leu-Gln-Asp-Val-His-Asn- or
-Lys-Leu-Gln-Asp-Val-His-Asn-Phe-.

4,086,197

HARDENERS FOR EPOXY RESINS

Claude Bouche, and Francois Lenclud, both of Mazingarbe, France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Jun. 21, 1976, Ser. No. 697,751
Claims priority, application France, Jun. 20, 1975, 75 19387
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 PN **14 Claims**

1. A hardener for an epoxy resin, comprising the product resulting from the elimination of at least one mole of water per acid equivalent from a mixture of:

90 to 60 parts of at least one unsaturated monomeric fatty acid having at least 12 carbon atoms,

10 to 40 parts of an acid having a molecular weight less than 200

20 to 80 parts of a tetraethylene pentamine, and

80 to 20 parts of isophorone diamine,

the relative proportions of all the acid products with respect to all the amine products being from 1 to 2 gram equivalents of acid function per gram molecule of amine.

4,086,198

COMPOSITION FOR HOT MELT-TYPE WHITE TRAFFIC PAINT

Kinya Mizui, Hiroshima, and Hiroshi Wakumoto, Yamaguchi, both of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Jun. 7, 1973, Ser. No. 367,905
Claims priority, application Japan, Jun. 8, 1972, 47-57161
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—23.7 C **15 Claims**

1. A composition for a hot melt-type white traffic point comprising:

(A)(1) 100 parts by weight of an acid-modified hydrocarbon resin having an acid value of 0.10 to 15 obtained by an oxidation of a thermoplastic hydrocarbon resin in a liquid state or by a reaction of the thermoplastic hydrocarbon resin with an α,β-unsaturated carboxylic acid or anhydride thereof, said thermoplastic hydrocarbon resin being solid at room temperature having an average molecular weight of 500 to 3,000, a softening point of 60° to 150° C as determined by the ring ball method and a Gardner color of not greater than 10, as measured for 100% resin, or

(2) an esterified hydrocarbon resin obtained by the reaction of said acid-modified hydrocarbon resin with an alcohol, and

(B) 25 to 300 parts by weight of titanium dioxide.

4,086,199

LATICES OF POLYMER PARTICLES COMPRISING A CORE CONTAINING A VINYL POLYMER AND A PERIPHERY CONTAINING A POLYMER HAVING —CN GROUPS

Jean-Claude Daniel, Fontenay sous Bois, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed Aug. 9, 1976, Ser. No. 713,055
Claims priority, application France, Aug. 22, 1975, 75 26057
Int. Cl.[2] C08L *9/04*
U.S. Cl. 260—29.7 UP **27 Claims**

1. Latices of polymer particles in aqueous dispersion having a uniform diameter within the range of 0.2 to 2 μm and comprising a core selected from the group consisting of a vinyl homopolymer, and a vinyl copolymer, and a periphery formed of a copolymer having —CN groups.

4,086,200

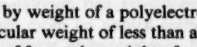
VINYLIDENE CHLORIDE POLYMER LATEX BASED CEMENT ADDITIVES

Lz F. Lamoria, and Robert D. Van Dell, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 15, 1977, Ser. No. 815,967
Int. Cl.[2] C08K *3/00*
U.S. Cl. 260—29.6 S **12 Claims**

1. A cement additive consisting essentially of (1) a vinylidene chloride polymer latex containing up to about 60 parts by weight of polymer solids, said vinylidene chloride polymer latex consists essentially of from about 35 to about 90 percent by weight of vinylidene chloride and from about 65 to about 10 percent by weight of at least one other interpolymerized material of the general formula:

wherein R is selected from the group consisting of hydrogen and the methyl group and X is selected from the group consisting of —CN, halogens of atomic numbers 9 to 35, and ester-forming groups, —COOY, wherein Y is selected from the group consisting of a primary alkyl group and a secondary alkyl group, each of the foregoing alkyl groups containing from 1 to b 18 carbon atoms; and, based on 100 parts of said latex polymer solids (2) from about 3 to about 10 parts by weight of a nonionic surfactnat; (3) from about 2.5 to about 10 parts by weight of a polyelectrolyte having a number average molecular weight of less than about 3000 and consisting essentially of 3 parts by weight of methyl mathacrylate and about 1 part by weight of a sulfo-ester of α-methylene carboxylic acid or its salt having the formula



wherein the radical R is selected from the group consisting of vinyl and α-substituted vinyl, and the radical —Q— is a divalent hydrocarbon radical having its valence bonds on a different carbon atom, and M is a cation, and (4) from about 0.1 to about 5 parts by weight of a polyorganosiloxane foam depressant.

4,086,201

STYRENE-BUTADIENE INTERPOLYMER LATEX BASED CEMENT ADDITIVES

James Peters; Robert D. VanDell; R. Douglas Eash, and Lz F. Lamoria, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 15, 1977, Ser. No. 816,052
Int. Cl.[2] C08K *3/00*
U.S. Cl. 260—29.7 S **14 Claims**

1. A cement additive consisting essentially of (1) a styrene-butadiene interpolymer latex, said latex containing up to about

60 parts by weight of interpolymer solids, and, based on 100 parts of said latex polymer solids; said styrene-butadiene interpolymer has a styrene to butadiene weight ratio of from about 30:70 to about 70:30; (2) from about 3 to about 10 parts by weight of a nonionic surfactant, (3) from about 0.3 to about 10 parts by weight of a polyelectrolyte having a number average molecular weight of less than about 3000 consisting essentially of about 3 parts by weight of methyl methacrylate and about 1 part by weight of a sulfoester of -methylene carboxylic acid or its salt having the formula

$$R—CO_2—Q—SO_3M$$

wherein the radical R is selected from the group consisting of vinyl and —-substituted vinyl, and the radical —Q— is a divalent hydrocarbon radical having its valence bonds on a different carbon atom, and M is a cation, and (4) from about 0.1 to about 5 parts by weight of a polyorganosiloxane foam depressant.

4,086,202
NON-AQUEOUS POLYMERIC DISPERSION AND MATTE COATINGS PRODUCED THEREFROM

Charles K. Beck, Mentor, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Jul. 30, 1976, Ser. No. 709,962
Int. Cl.² B32B *27/06, 27/30;* **C08K** *5/05, 5/06*
U.S. Cl. 260—33.2 R **8 Claims**

1. A non-aqueous dispersion, which has the property of drying to a uniform matte finish upon application to a surface, consisting essentially of a co-polymer of an alkyl methacrylate and an alkyl acrylate and an organic liquid having a hydrogen bonding index,δ, greater than 10, a dipole moment,μ, between 0.5 and 2.5, and a solubility parameter,δ, less than 8, said co-polymer being the disperse phase and said organic liquid comprising a member selected from the group consisting of ethers and alcohols and constituting the continuous phase of the non-aqueous dispersion.

8. A non-pigmented matte coating produced by applying a dispersion according to claim 1 to a surface and allowing the dispersion to dry thereon.

4,086,203
FIBERS SIZED WITH POLYESTER AND POLYURETHANE PRECURSORS

Bryan Shaw; Valerie Lawton, and James McAinsh, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 304,952, Nov. 9, 1972, abandoned. This application Apr. 23, 1975, Ser. No. 570,747
Claims priority, application United Kingdom, Nov. 12, 1971, 52595/71
Int. Cl.² C08K *9/04*
U.S. Cl. 260—40 R **9 Claims**

1. A method of forming fiber reinforced composites comprising:

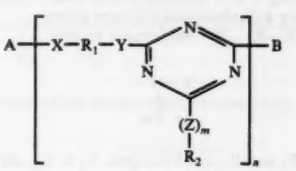
(1) coating a fiber with a size which comprises (a) a mixture of from 5–95% by weight of a polyurethane or precursors thereof having at least one polyfunctional compound containing groups reactive with isocyanate groups and at least one polyisocyanate together with (b) from 95–5% by weight of a cross-linked polyester resin precursor comprising:
  (i) at least one ethylenically unsaturated polyester, and;
  (ii) at least one ethylenically unsaturated monomer copolymerizable with said unsaturated polyester;
(2) partially or completely curing the size;
(3) mixing the sized fiber with curable resin;
(4) subjecting the mixture to a shaping operation during or after its preparation;
(5) curing the resin and any incompletely cured size.

4,086,204
NOVEL POLYTRIAZINE COMPOUNDS

Paolo Cassandrini, Bologna, and Antonio Tozzi, Sasso Marconi, both of Italy, assignors to Chimosa Chimica Organica S.p.A., Marconi, Italy

Filed Jun. 23, 1976, Ser. No. 699,162
Claims priority, application Italy, Dec. 4, 1975, 52527 A/75
Int. Cl.² C08K *5/00;* **C07D** *251/00, 251/54, 239/00*
U.S. Cl. 260—45.8 NT **28 Claims**

1. A compound having the formula (I):

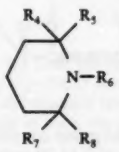


(I)

wherein

X, Y, Z, the same or different, is a member selected from —O—, —S—,

R_3 being a member selected from hydrogen, straight or branched chain C_1 to C_{18} alkyl, C_5 to C_{18} cycloalkyl, substituted or not substituted C_6 to C_{18} aryl, C_7 to C_{18} aralkyl, a piperidine radical of formula (II):



(II)

wherein

R_4, R_5, R_7, R_8, the same or different, are members selected from C_1 to C_6 alkyl, and R_6 is selected from H, O, C_1 to C_{18} straight or branched chain alkyl, C_2 to C_{18} alkenyl or alkynyl, C_7 to C_{18} aralkyl;

R_1 is selected from C_2 to C_{18} straight or branched chain alkylene, C_5 to C_{18} cycloalkylene, C_6 to C_{18} arylene, C_7 to C_{18} aralkylene;

R_2 is selected from hydrogen, chlorine, bromine, —OH, C_1 to C_{18} straight or branched chain alkyl, C_5 to C_{18} cycloalkyl, substituted or not substituted C_6 to C_{18} aryl, C_7 to C_{18} aralkyl, a piperidine radical of formula (II), a group

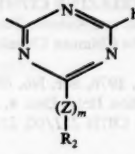
wherein

R_{11}, R_{12} are selected from hydrogen or C_1 to C_{12} alkyl, C_5 to C_{12} cycloalkyl, C_6 to C_{12} aryl, C_7 to C_{12} aralkyl;

m is an integer from 0 to 1;

n is an integer from 2 to 200;

A, B are the terminal groups, A being H or



and B is halogen or —X—R_1—YH;
or where —XR_1—Y— represent a bivalent heterocyclic group having 6 to 8 nitrogen atoms with X and y each representing a disubstituted nitrogen atom;
or where —X—R_1—Y— represent a residue

in which R_9 and R_{10} are hydrogen, C_1 to C_{12} alkyl, C_5 to C_{12} cycloalkyl, C_6 to C_{12} aryl, or C_7 to C_{12} aralkyl;
with the proviso that at least one of the radicals —X—R_1—Y— and —$(Z)_m$—R_2 contains a piperidine radical of formula (II).

14. A synthetic polymer of increased stability having incorporated with the polymer an amount of a compound according to claim 1 effective to increase the light stability of the polymer.

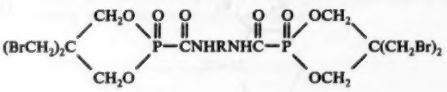
4,086,205

HYDROGEN PHOSPHONATES

Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

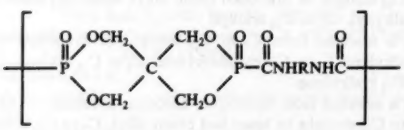
Filed Sep. 3, 1976, Ser. No. 720,324
Int. Cl.² C07F 9/38; C08K 5/17, 5/18
U.S. Cl. 260—45.8 R **9 Claims**

1. A cyclic phosphorus composition



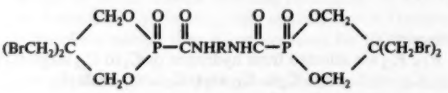
where R is selected from the group consisting of alkylene and alkyl substituted alkylenes of 2 to 20 carbon atoms, or is selected from the group consisting of arylene and alkyl substituted arylenes of 6 to 22 carbon atoms.

2. A cyclic phosphorus composition



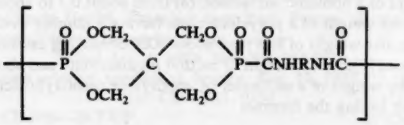
with —H and —NCO end groups, and having a degree of aggregation of 2 to 100, where R is selected from the group consisting of alkylene and alkyl substituted alkylenes of 2 to 20 carbon atoms, or is selected from the group consisting of arylene and alkyl substituted arylenes of 6 to 22 carbon atoms.

6. The combination of an organic polymer together with



where R is selected from the group consisting of alkylene and alkyl substituted alkylenes of 2 to 20 carbon atoms, or is selected from the group consisting of arylene and alkyl substituted arylenes of 6 to 22 carbon atoms.

7. The combination of an organic polymer together with



with —H and —NCO end groups, and having a degree of aggregation of 2 to 100,
where R is selected from the group consisting of alkylene and alkyl substituted alkylenes of 2 to 20 carbon atoms, or is selected from the group consisting of arylene and alkyl substituted arylenes of 6 to 22 carbon atoms.

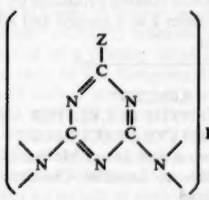
4,086,206

ORGANOPHOSPHORUS COMPOUNDS AND PROCESS FOR THE PRODUCTION THEREOF

Toranosuke Saito; Masakatu Kitani, both of Kobe; Kenshi Mori, Omuta, and Shinichi Izawa, Kawasaki, all of Japan, assignors to Sanko Kaihatsu Kagaku Kenkyosho, Osaka and Asahi-Dow Limited, Tokyo, both of, Japan

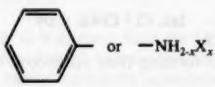
Filed Jul. 5, 1977, Ser. No. 812,943
Claims priority, application Japan, Jul. 5, 1976, 51-78874; Jun. 6, 1977, 52-65815
Int. Cl.² C07D 251/18, 251/54; C08K 5/34
U.S. Cl. 260—45.8 NT **12 Claims**

11. A flame retardant resin composition comprising a normally inflammable synthetic resin and a suitable amount of phosphorus-containing condensation products of Formula I

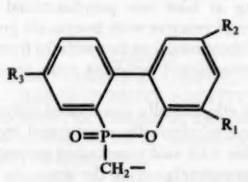


I

wherein Z represents radical



and X is radical



II

wherein R_1, R_2 and R_3 each is hydrogen, a halogen atom, an alkyl group of 1 to 8 carbon atoms, an aralkyl group, cyclohexyl or phenyl, x is 0, 1 or 2 and y is from 1 to 4.

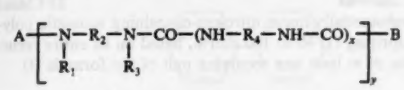
4,086,207

POLYUREA COMPOUNDS WHICH IMPROVE THE LIGHT STABILITY OF POLYMERS

Paolo Cassandrini, Bologna, and Antonio Tozzi, Sasso Marconi, both of Italy, assignors to Chimosa Chimica Organica S.p.A., Marconi, Italy

Filed Jun. 23, 1976, Ser. No. 699,161
Claims priority, application Italy, Nov. 18, 1975, 52254/75
Int. Cl.[2] C08K 5/34; C08G 18/32; C07D 211/98
U.S. Cl. 260—45.8 N 23 Claims

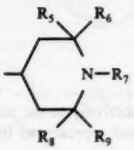
1. A compound which either (1) has the formula



(I)

wherein:

R_1 is a member selected from hydrogen, straight and branched alkyl having 1 to 18 carbon atoms, cycloalkyl having 5 to 18 carbon atoms, aryl and substituted aryl having 6 to 18 carbon atoms, aralkyl having 7 to 18 carbon atoms, a piperidine radial having the formula:



(II)

in which R_5, R_6, R_8 and R_9 are members individually selected from alkyl having 1 to 6 carbon atoms and R_7 is selected from hydrogen, oxygen, straight and branched chain alkyl having 1 to 18 carbon atoms, alkenyl and alkinyl having 2 to 18 carbon atoms, aralkyl having 7 to 18 carbon atoms;

R_2 is a member selected from straight and branched chain alkylene having 2 to 18 carbon atoms, cycloalkylene having 5 to 18 carbon atoms, arylene having 6 to 18 carbon atoms, aralkylene having 7 to 18 carbon atoms;

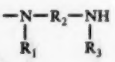
R_3 is a piperidine radical of formula (II);

R_4 is a member selected from straight and branched chain alkylene having 2 to 18 carbon atoms, cycloalkylene having 5 to 18 carbon atoms, arylene having 6 to 18 carbon atoms, aralkylene having 7 to 18 carbon atoms;

x is either 0 or 1;

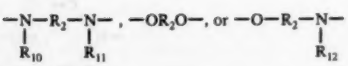
y is an integer from 2 to 200;

A and B each represents a terminal group wherein A is H and B is

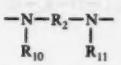


or (2) has the formula (I) in which a proportion of the y units and the terminal group B has the radical

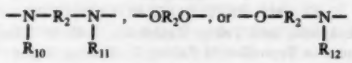
replaced by



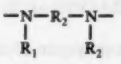
wherein R_{10}, R_{11} and R_{12} are hydrogen, alkyl having 1 to 18 carbon atoms, cycloalkyl having 5 to 18 carbon atoms, aryl having 6 to 18 carbon atoms, aralkyl having 7 to 18 carbon atoms, or R_{10} and R_{11} are linked together so that the group



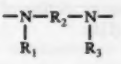
forms a heterocyclic ring having 6 to 8 inclusive members and which contains 2 nitrogen atoms; the proportion of y units with a replaced radical resulting from using in the reaction not over 2 moles of an amine or hydroxyl reactant containing the replacing radicals



per mole of the amine reactant containing the radical



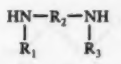
so that per one y unit containing a radical



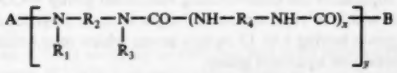
0 to 2 y units having said radical replaced are present.

14. A synthetic polymer composition of increased light stability having incorporated with the polymer an amount of a compound according to claim 1 effective to increase the light stability of the polymer.

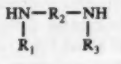
23. A method of preparing a compound according to claim 1 comprising reacting either a diamine having the formula



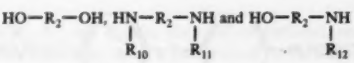
with a reactant selected from the group consisting of carbonyl chloride and OCN—R_4—NCO in an inert solvent, in a molar ratio of diamine to said reactant ranging from 1:1 to 1.5:1 at a temperature sufficient to form the compound having the formula



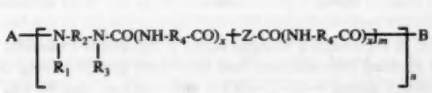
or employing a corresponding mixture of the diamine



with not over 2 moles per mole of said diamine of a compound selected from the group consisting of

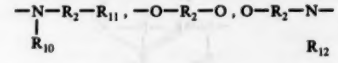


to form the compound



(III)

where Z represents a radical



m is a number from 0 to 2 and $n = y/(1+m)$.

4,086,208

FLAME RESISTANT POLYESTERS

Ken Murayama, and Takao Kashihara, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

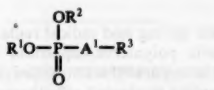
Filed Jan. 14, 1976, Ser. No. 648,975

Claims priority, application Japan, Jan. 17, 1975, 50-7072; May 16, 1975, 50-59061

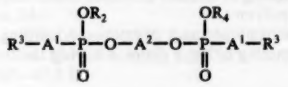
Int. Cl.[2] C08G 63/20, 79/04

U.S. Cl. 260—47 C **9 Claims**

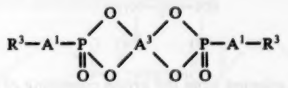
1. A flame resistant polyester comprising a polymer prepared by polymerizing an aromatic dicarboxylic acid or an ester-forming derivative thereof, a diol or an ester-forming derivative thereof, and at least one phosphorus compound selected from the group consisting of compounds having the formulae (I), (II), and (III):



(I)



(II)



(III)

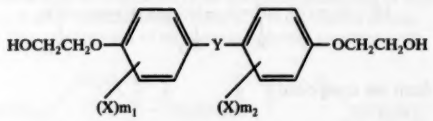
wherein R^1, R^2, and R^4 may be the same or different and represent hydrogen atoms or hydrocarbon groups having 1 to 18 carbon atoms which may contain at least one halogen atom, R^1 and R^2 being capable of forming a ring when taken together,

R^3 represents the ester-forming functional group —$COOR^5$, in which R^5 represents a hydrogen atom or a hydrocarbon group having 1 to 12 carbon atoms which may contain at least one hydroxyl group,

A^1 and A^2 may be the same or different and represent bivalent hydrocarbon groups having 1 to 12 carbon atoms which may contain at least one halogen atom, and

A^3 represents a quadrivalent hydrocarbon group having 5 or 6 carbon atoms, the content of phosphorus in the polymer being in a range of about 500 to about 50,000 ppm.

7. The flame resistant polyester as claimed in claim 1 wherein said diol or the ester-forming derivative thereof is, not exclusively, a glycol having the formula:



wherein X represents a halogen atom, Y represents a bivalent group selected from alkylene and alkylidene groups having 1 to 6 carbon atoms, —O—, —SO— and —SO_2—, and m_1 and m_2 are integers of 1 to 4, respectively.

4,086,209

NOVEL NITROGEN-CONTAINING AROMATIC POLYMERS AND PROCESS FOR THEIR PREPARATION

Shigeyoshi Hara, Hino; Masao Senoo, Ehime; Koh Mori, and Yutaka Taketani, both of Hino, all of Japan, assignors to Teijin Limited, Osaka, Japan

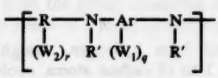
Filed Feb. 20, 1975, Ser. No. 551,311

Claims priority, application Japan, Feb. 21, 1974, 49-19883; May 17, 1974, 49-55148; May 20, 1974, 49-55627; May 23, 1974, 49-57292; May 24, 1974, 49-57792

Int. Cl.[2] C08G 65/34

U.S. Cl. 260—49 **23 Claims**

1. A substantially linear nitrogen-containing aromatic polymer comprising (1) 40 to 100 mol%, based on its entire recurring units, of at least one recurring unit of the formula (I)

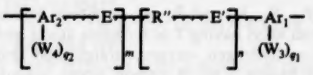


(I)

wherein

Ar is an aromatic group of 6 to 50 carbon atoms having a valence of $(2 + q)$ with the two

groups being bonded respectively to the nuclear carbon atoms of the aromatic ring Ar and represented by the formula (II)



(II)

wherein

Ar_1 is an aromatic ring group containing 6 to 20 carbon atoms and having a valence of $(q_1 + 2)$ or $(q_1 + 3)$;

Ar_2 is an aromatic ring group containing 6 to 20 carbon atoms and having a valence of $(q_2 + 2)$ or $(q_2 + 3)$;

W_3 and W_4 are identical or different and have the same definition as W_1 given below;

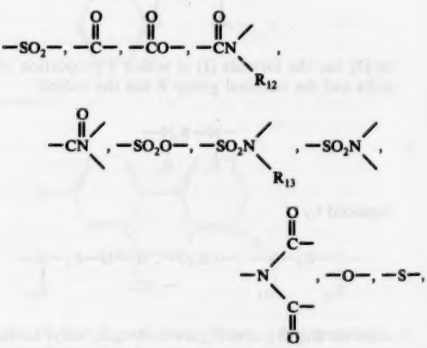
q_1 is an integer of 0 to 4;

q_2 is an integer of 0 to 4;

with the proviso that an average of $(q_1 + q_2 + r)$ is at least 0.2;

m and n are 0 or 1, and when m is 0, n is also 0; the symbol ... represents the presence or absence of a bond;

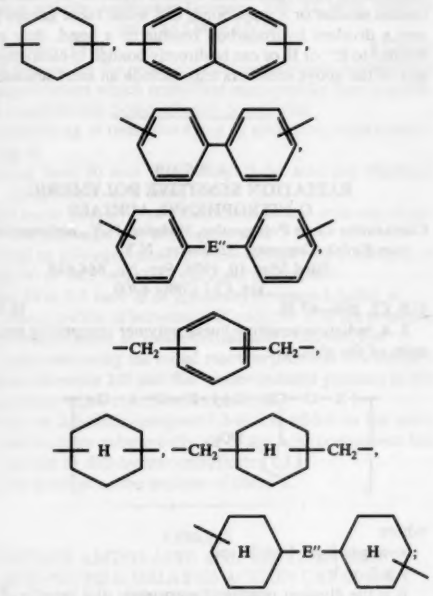
E and E' are identical or different and each represent at least one non-aromatic bridging group selected from the group consisting of



and alkylene groups containing 1 to 6 carbon atoms,

R_{12} and R_{13} being identical or different and each representing a hydrogen atoms or an organic group containing 1 to 6 carbon atoms; and

R'' represents alkylene of 2 to 15 carbon atoms or a member selected from the group consisting of



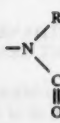
wherein

E'' is a non-aromatic bridging group having the same definition as E above;

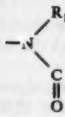
W_1 and W_2 are identical or different and represent at least one group selected from the group consisting of

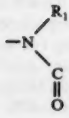
(a)

(b)

(c) 

(d)

(e) 

(f) 

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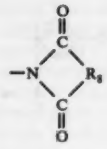
(g) 

wherein

R_1, R_3, R_6 and R_7 are identical or different and represent a hydrogen atom or an organic group containing 1 to 20 carbon atoms which in principle has a valence of 1;

R_2 and R_5 represent an organic group containing 1 to 20 carbon atoms which in principle has a valence of 1;

R_4 represents a hydroxyl group or an organic group containing 1 to 20 carbon atoms which in principle has a valence of 1;

R_8 is a divalent organic group containing 1 to 20 carbon atoms; and

R_1 and R_2, R_1 and R_3, R_1 and R_4, R_1 and R_5, R_1 and R_6, R_6 and R_7, respectively, can be bonded to each other directly or through a hetero atom;

q is an integer of 0 to 4;

r is an integer of 0 to 4, with the proviso that an average of $(q + r)$ is at least 0.2;

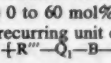
R' is a hydrogen atom or monovalent or divalent hydrocarbon residue of 1 to 20 carbon atoms, and when R' is divalent, it is optionally bonded to R, or R' of one of the

linked to R' of the other

and

R is an organic group of 2 to 50 carbon atoms having a valence of $(2 + r)$, $(3 + r)$ or $(4 + r)$ according to the definition of R'; and

(2) 0 to 60 mol% of the remaining recurring units being a recurring unit of the formula (III)

 (III)

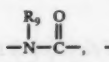
wherein

B and R''' are identical or different and each represents the group (R) which is an organic group of 2 to 50 carbon atoms having a valence of $(2 + r')$, $(3 + r')$ or $(4 + r')$,

wherein

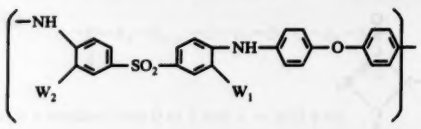
r' is an integer of 0 to 4, according to the definition of R', the group (R) being identical or different from R; and

Q_1 and Q_2 are identical or different and are each selected from the group consisting of



in which R_9, R_{10} and R_{11} are identical or different, and each represents a hydrogen atom, a monovalent or divalent hydrocarbon residue or a mere bond, and when these groups represent a divalent hydrocarbon residue or a bond, they can be bonded to R''' or B, or can be directly bonded to each other, and any of the above members may include an inert substituent.

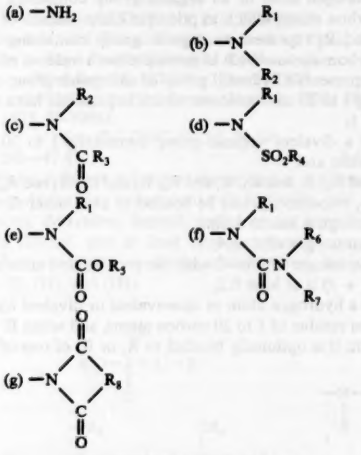
15. A substantially linear primary amino containing aromtic polymer comprising (1) 40 to 100 mol%, based on its entire recurring units, of at least one recurring unit of the following formula



(b-1)

wherein

W_1 and W_2 are identical or different and represent at least one group selected from the group consisting of



wherein

R_1, R_3, R_6 and R_7 are identical or different and represent a hydrogen atom or an organic group containing 1 to 20 carbon atoms which in principle has a valence of 1;

R_2 and R_5 represent an organic group containing 1 to 20 carbon atoms which in principle has a valence of 1;

R_4 represents a hydroxyl group or an organic group containing 1 to 20 carbon atoms which in principle has a valence of 1;

R_8 is a divalent organic group containing 1 to 20 carbon atoms; and

R_1 and R_2, R_1 and R_3, R_1 and R_4, R_1 and R_5, R_1 and R_6, R_6 and R_7, respectively, can be bonded to each other directly or through a hetero atom.; and

(2) 0 to 60 mol%, based on its entire recurring units, of at least one recurring unit of the formula (III)

$$, -R'''-Q_1-B-Q_2- \quad \text{(III)}$$

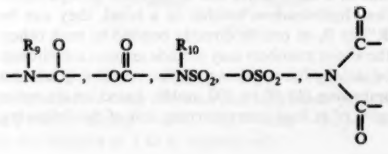
wherein

B and R''' are identical or different and each represent the group (R) which is an organic group of 2 to 50 carbon atoms having a valence of $(2 + r')$, $(3 + r')$ or $(4 + r')$,

wherein

r' is an integer of 0 to 4, according to the definition of R', the group (R) being identical to or different from R' and

Q_1 and Q_2 are identical or different and are each selected from the group consisting of



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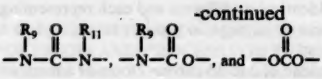


in which R_9, R_{10} and R_{11} are identical or different, and each represents a hydrogen atom, a monovalent or divalent hydrocarbon residue or a mere bond, and when these groups represent a divalent hydrocarbon residue or a bond, they can be bonded to R''' or B, or can be directly bonded to each other, and any of the above members may include an inert substituent.

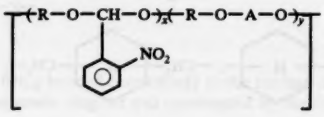
4,086,210

RADIATION SENSITIVE POLYMERIC O-NITROPHENYL ACETALS

Constantine Chris Petropoulos, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 10, 1976, Ser. No. 684,696
Int. Cl.[2] C08G *4/00*
U.S. Cl. 260—67 R **16 Claims**

1. A radiation-sensitive linear polymer comprising recurring units of the structure



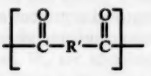
where

x ranges from 1 to 20 and

y is 0 or 1,

R is the divalent residue of an organic diol capable of forming a linear polyacetal with an aldehyde,

A is



where R' is arylene.

4,086,211

METHOD OF PRODUCING POLYURETHANE PRODUCTS HAVING AN IMPROVED FLEX CRACK RESISTANCE

Hideo Nakauchi; Toshiyuki Osaki, both of Higashi-Murayama; Kazuo Naito, and Sakae Inoue, both of Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 667,069
Claims priority, application Japan, Mar. 14, 1975, 50-30214
Int. Cl.[2] C08G *18/82, 18/32*
U.S. Cl. 260—75 NA **7 Claims**

1. A method of producing a polyurethane product having improved flex-crack resistance, which comprises the steps of:

(1) curing a mixture of:

(a) an isocyanate terminated polyether type polyurethane prepolymer having a molecular weight 800–20,000 and

(b) a polyamine curative in an amount of 0.6–0.9 equivalent per isocyanate equivalent of said prepolymer,

(2) post-curing the reaction product from step (1), and

(3) subsequently heat treating the resultant article for 60–18,000 minutes under an atmosphere of a temperature of 80°–140° C and an absolute humidity of 5–80%.

4,086,212
POLY(ETHYLENE/ALKYLENE) TEREPHTHALATES WHICH CRYSTALLIZE RAPIDLY

Peter Bier; Rudolf Binsack, and Hugo Vernaleken, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 17, 1976, Ser. No. 658,816
Claims priority, application Germany, Feb. 22, 1975, 2507674
Int. Cl.² C08G *63/12*
U.S. Cl. 260—75 R 4 Claims

1. A process for the production of thermoplastic terephthalic acid copolyesters which crystallize more rapidly than polyethylene terephthalate homopolymer comprising

(1) esterifying or transesterifying an acid component consisting of

(a) at least 90 mol % of terephthalic acid and dimethyl terephthalic acid ester, and

(b) up to 10 mol % of other aliphatic and aromatic dicarboxylic acids and acid esters with

(2) 1.05 to 2.04 equivalents of a diol component consisting of

(a) 90 to 99.5 mol % of ethylene glycol, and

(b) 10 to 0.5 mol % of 2,2-diethylpropane-1,3-diol at

(3) a temperature of between 150° and 250° C in the presence of esterification or transesterification catalysts, and

(4) polycondensing the initial reaction products at a temperature between 200 and 300° under reduced pressure in the presence of an esterification catalyst,

wherein the 2,2-diethylpropane-1,3-diol is added to the reaction mixture after substantially all of the acid component has been reacted to di(2-hydroxyethyl)ester.

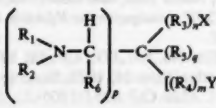
2. The product of the process of claim 1.

4,086,213
TERTIARY AMINO ACID AND TERTIARY AMINO ACID-NITRILE DELAYED ACTION CATALYST COMPOSITIONS

Ibrahim S. Bechara, Boothwyn; Philip J. Zaluska, Glen Riddle, and Rocco L. Mascioli, Media, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Aug. 26, 1976, Ser. No. 717,579
Int. Cl.² C08G *18/18*
U.S. Cl. 260—77.5 AB 11 Claims

1. In a process for polymerizing a urethane forming composition comprising an organic polyisocyanate and a polyol, in the presence of an organometallic catalyst, the improvement which comprises including as a catalyst component an amino catalyst selected from the group consisting of a polyfunctional amino acid and an amine salt of a polyfunctional amino acid as represented by the formula:



wherein R_1 and R_2 are hydrogen atoms with only one being hydrogen at a time, alkyl and substituted alkyl groups having from 1 to 15 carbon atoms, or combined to form a piperidine, piperizine, morpholine, imidazole or imidazoline radical;

wherein R_3 and R_4 are alkylene groups having from 1 to 2 atoms, aralkylene with the alkylene portion having from 2 to 6 carbons, substituted alkylene and substituted aralkylene;

wherein R_5 is hydrogen, a lower alkyl group having from 1 to 6 carbon atoms, an alkenyl group having from 1 to 6 carbon atoms, an aryl group, a cyclic group and substituted derivatives thereof, or a keto alkyl group with the alkyl portion having from 1 to 6 carbon atoms;

wherein R_6 is hydrogen, or a radical selected from the group consisting of alkyl, phenyl, furfuryl, naphthyl, and substituted derivatives of such groups;

wherein X is a carboxylic acid group or a quaternary ammonium salt of an acid group;

wherein Y is a carboxylic acid group, nitrile group, or a quaternary ammonium salt of an acid group; and

wherein *m*, *n* and *s* independently are 0 or 1;

wherein *q* is 0 or 1;

wherein *p* independently is 1 or 2; and

wherein $p + q + s$ is 3.

4,086,214
PROCESS FOR PREPARING POLY(ε-CAPROLACTONE) POLYURETHANES

Charles Frederick Cardy, Luton, England, assignor to Interox Chemicals Ltd., London, England

Filed Jan. 19, 1976, Ser. No. 650,160
Claims priority, application United Kingdom, Feb. 10, 1975, 05603/75
Int. Cl.² C08G *18/42, 18/18, 18/22*
U.S. Cl. 260—77.5 AN 13 Claims

1. A process for the preparation of urethane polymers by the reaction together of a diisocyanate, a poly (ε-caprolactone)diol having a molecular weight in the range of from 1000 to 3000 and a chain extender, which comprises the steps of:

(a) forming an isocyanate-rich quasi-prepolymer by reacting all of the diisocyanate with a part of the poly(ε-caprolactone)diol such that a major proportion of the isocyanate groups remain unreacted,

(b) forming an hydroxyl-rich prepolymer by reacting all of the chain extender and the remaining part of the poly(ε-caprolactone)diol with sufficient of the said quasi-prepolymer such that a major proportion of the hydroxyl groups remain unreacted, and

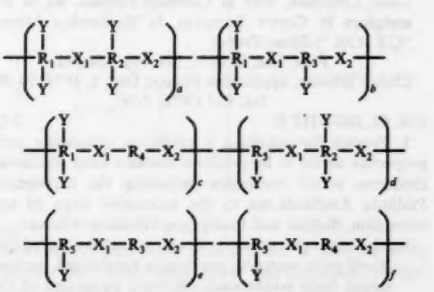
(c) mixing in the liquid phase the said quasi-prepolymer with the said hydroxyl-rich prepolymer and reacting the said quasi-prepolymer with the said hydroxyl-rich prepolymer to give a urethane polymer.

4,086,215
CROSSLINKED ORGANIC POLYAMIDE OR POLYHYDRAZINE PERMSELECTIVE POLYMERIC MEMBRANES

Masaru Kurihara; Soichi Tokizane; Tatsundo Tanaka; Masamitsu Tanimura, and Yoichi Shimokawa, all of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 7, 1976, Ser. No. 647,138
Claims priority, application Japan, Jan. 8, 1975, 50-4459
Int. Cl.² C08G *69/48*
U.S. Cl. 260—78 R 22 Claims

1. A permselective polymeric membrane consisting essentially of a synthetic organic polyamide or polyhydrazide represented by the following formula:



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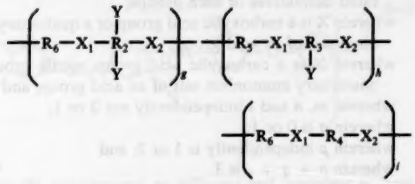


wherein

(a) *a, b, c, d, e, f, g, h* and *i* represent the molar fraction (%) of each component, each being larger than zero or equal to zero, and satisfying the following relations:

$$a + b + c + d + e + f + g + h + i = 100$$

$$a + b + c + d + e + f + g + h > 0$$

(b) R_1,R_2, R_3, R_4, R_5 and R_6 are members selected from the group consisting of carbocyclic aromatic, heterocyclic, and alicyclic groups having 4 to 30 carbon atoms,

(c) X_1 is a group selected from the class consisting of —NH-CO—, —CO— and —CONHNHCO—, wherein, in the case of —CO—, it is bonded directly to a nitrogen atom in the heterocycle in R_1, R_5 or R_6,

(d) X_2 is a group selected from the class consisting of —CONH—, and —CO—, and —CONHNHCO—, wherein, in the case of —CO—, it is bonded directly to a nitrogen atom in the heterocycle in R_1, R_5 or R_6,

(e) Y is a group selected from the class consisting of CO_2H and $—SO_3H$, and

(f) the polymer has a molecular weight high enough to provide a film, a solvent for the polymer, and an inorganic salt selected from the class consisting of LiCl, LiBr, $LiNO_3$, $CaCl_2$ and $MgCl_2$, the total number of cross-linked groups for divalent metal ions in the polymer repeating units being in the range of $7.0 \times 10^{-5} - 7.0 \times 10^{-3}$, the concentration of said ionic groups in the polymer, expressed as P.I., is in the range of $3.5 \times 10^{-4} - 1.4 \times 10^{-2}$, where P.I. represents the following ratio;

$$P.I. = \frac{\text{total number of ionic groups in a polymer repeating unit}}{\text{Molecular weight of the polymer repeating unit}}$$

said polyamide or polyhydrazide being ionically cross-linked with a salt of a metal selected from the class consisting of alkaline earth metals, transition metals, aluminum group metals and lead group metals.

4,086,216

GLYCOPROTEIN EXTRACTED FROM THE MUSHROOM PSALLIOTA XANTHODERMA AND ITS APPLICATION IN ANTI-VIRAL THERAPY

Roland-Yves Mauvernay, Riom; Henri-Jean Pourrat, and Jean-Louis Lamaison, both of Clermont-Ferrand, all of France, assignors to Centre Europeen de Recherches Mauvernay "C.E.R.M.", Riom, France

Filed Dec. 2, 1975, Ser. No. 636,941

Claims priority, application France, Dec. 2, 1974, 74 39329

Int. Cl.² C07G *7/00*

U.S. Cl. 260—112 R **2 Claims**

1. Process for obtaining a substance, possessing anti-viral properties useful in herpetiform diseases from Psalliota Xanthoderma which comprises subjecting the carpophores of Psalliota Xanthoderma to the successive steps of aqueous extraction, dialysis and finally lyophilization wherein

(a) the aqueous extraction is carried out by the addition of 10–40 parts water to previously lyophilised, ground and sieved fresh mushrooms, followed by mixing of the suspension for about 30 minutes at 35°–50° C and collection of the extraction fluid by filtration;

(b) the dialysis is carried on the filtrate from the aqueous extraction phase, previously adjusted to pH 6.5 to 7.0, for 60–70 hours at a temperature of about 10°–15° C; and

(c) the lyophilization is carried out by the freezing, at −60° C, of the dialysed solution followed by slow lyophilization for 60–70 hours.

4,086,217

CARCINOEMBRYONIC ANTIGENS

Hans John Hansen, Allendale, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 663,405, Mar. 3, 1976, abandoned, which is a division of Ser. No. 469,197, May 13, 1974, Pat. No. 3,956,258, which is a division of Ser. No. 252,700, May 12, 1972, Pat. No. 3,867,363, which is a continuation-in-part of Ser. No. 133,404, Apr. 12, 1971, Pat. No. 3,697,638, which is a continuation-in-part of Ser. No. 110,288, Jan. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 42,526, Jun. 1, 1970, abandoned. This application Feb. 18, 1977, Ser. No. 770,000

Int. Cl.² C07G *7/00*

U.S. Cl. 260—112 R **2 Claims**

1. A process of producing human carcinoembryonic antigen component A which comprises subjecting carcinoembryonic antigen material to chromatography on a mixed bed cellulose ion exchange column comprising microgranular diethylaminoethyl cellulose in the free base form having rod shaped particles, a capacity of 1.0 ± 0.1 meq./gm., a particle size distribution of about 20 μ to about 60 μ and a water regain of 2.3 to 2.8 gm./gm. dry exchanger, and a microgranular carboxymethyl cellulose with a capacity of 1.0 ± 0.1 meq./gm., having rod shaped particles, a particle size distribution of about 20 μ to about 60 μ and a water regain of 2.3 to 2.7 gm./gm. dry exchanger, and collecting the eluates resulting from eluting with ammonium acetate at pH 4 in 0.05 M sodium chloride followed by subjecting the resulting material to sequential chromatography on two different gel columns, the first of which is an agarose gel having about 6% by weight agarose and a particle size of from 40–210 microns and the second of which is a hydrophilic water-insoluble cross-linked dextran polymer gel and collecting and concentrating the eluates which have a spectrophotometric absorption peak wave length of 280 mμ and a molecular weight of about 200,000 to 500,000.

4,086,218

METHOD OF PRESERVING BLOOD PLASMA II

Edward Shanbrom, Santa Ana, and Robert C. Bishop, Los Angeles, both of Calif., assignors to Edward Shanbrom, Inc., Santa Ana, Calif.

Continuation of Ser. No. 567,371, Apr. 11, 1975, abandoned. This application May 16, 1977, Ser. No. 797,108

Int. Cl.² A23J *1/06*

U.S. Cl. 260—112 B **1 Claim**

1. The method of preserving blood plasma coagulation factors and other proteins during freezing and thawing of plasma for improving the recovery of coagulation proteins thereafter comprising the steps of:

(a) adding to whole, fresh blood plasma a preservative solution consisting essentially of heparin and polyethylene glycol to a concentration of from about 0.1 to about 25 grams of said polyol and from about 10 to about 2000 units of heparin per liter of plasma;

(b) thereafter freezing the blood plasma containing said preservative; and

(c) thereafter thawing the frozen blood plasma containing the preservative solution to recover therefrom plasma cryoprecipitate from which plasma proteins can be recovered in improved yield.

4,086,219
NONAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Eugene Leroy Wittle, and Mildred Catherine Rebstock, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Continuation-in-part of Ser. No. 626,805, Oct. 29, 1975, abandoned. This application Dec. 27, 1976, Ser. No. 754,785
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 LH 9 Claims

1. A compound having the name

Nᵅ-Benzyloxycarbonyl-L-leucyl-L-tryptophyl-L-seryl-L-tyrosyl-D-asparaginyl-L-leucyl-arginyl-L-prolyl-glycinamide

and salts thereof.

4,086,220
FRAGMENTS OF SECRETIN

James M. Schlatter, Glenview, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 9, 1976, Ser. No. 713,210
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R 8 Claims

1. A compound of the formula

H—X—Ser—Asp—Gly—Thr—Phe—Thr—Ser—
1 2 3 4 5 6 7 8

Glu—Leu—Ser—Arg—Leu—Arg—Y—NH_2
9 10 11 12 13 14

wherein

X is His or His(DNP);

Y is selected from a group consisting of

Asp,

Asp-Ser,

Asp-Ser-Ala,

Asp-Ser-Ala-Arg, and

Asp-Ser-Ala-Arg-Leu;

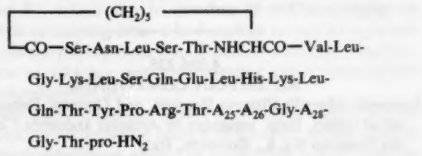
and the stereochemical configuration of each of the optically active amino acid residues may independently be *D, L* or *DL.*

4,086,221
POLYPEPTIDES AND PROCESS FOR PRODUCING THE SAME

Shumpei Sakakibara, Suita; Tadanori Morikawa, Takatsuki; Eisuke Munekata, Toyonaka; Terutoshi Kimura, Takarazuka; Yasuo Nakagawa, Nishinomya, and Toshiharu Noda, Toyonaka, all of Japan, assignors to Toyo Jozo Kabushiki Kaisha, Japan

Filed May 3, 1976, Ser. No. 682,752
Claims priority, application Japan, May 1, 1975, 50-52064
Int. Cl.[2] C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 T 3 Claims

1. A polypeptide selected from the group consisting of a compound of the formula



wherein A_{25} is Asp or Asn, A_{26} is Val or Thr and A_{28} is Ala or Ser,

and a pharmaceutically acceptable acid addition salt or complex thereof.

4,086,222
METHOD OF ISOLATING ALBUMIN FROM BLOOD PRODUCTS

Lars-Olof Edvard Lindquist; Jan Hakan Berglof, and John Malcolm Curling, all of Uppsala, Sweden, assignors to Pharmacia Fine Chemicals AB, Uppsala, Sweden

Filed Sep. 28, 1976, Ser. No. 727,611
Claims priority, application Sweden, Oct. 9, 1975, 75112953
Int. Cl.[2] B01D *15/08;* A2D *1/00*
U.S. Cl. 260—122 5 Claims

1. A method of isolating albumin from plasma products, wherein a plasma fraction containing albumin in a dissolved form and being essentially free from the coagulation factors I, II, VII, VIII, IX and X and also from the main part of IgG, is subjected to a two-step chromatographic separation in arbitrary sequence

(a) on an anion exchanger by means of an aqueous buffer of pH 4.5 - 4.9 and an ionic strength of 0.025 - 0.1, and

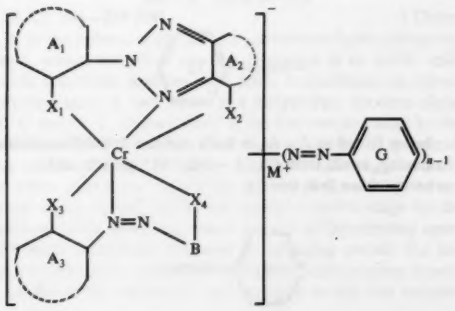
(b) on a cation exchanger by means of an aqueous buffer of pH 5.2 - 6.5 and an ionic strength of 0.1 - 0.05, the albumin rich fractions from the first chromatographic separation step being collected and subjected to the second chromatographic separation step, and the albumin rich fraction from the second chromatographic separation step being collected, desalted and worked-up, and wherein said ion exchangers consist of matrixes of hydrophilic organic polymers, which are water-insoluble but water-swellable and which are substituted with ion exchange groups.

4,086,223
ASYMMETRICAL 1:2-CHROMIUM COMPLEX AZO DYESTUFFS

Eginhard Steiner, Allschwil near Basel, and Fabio Beffa, Riehen near Basel, both of Switzerland, assignors to Ciba-Geigy AG, Switzerland

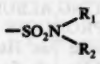
Continuation of Ser. No. 660,402, Feb. 23, 1976, abandoned, which is a continuation of Ser. No. 584,891, Jun. 9, 1975, abandoned, which is a continuation of Ser. No. 496,283, Aug. 8, 1974, abandoned, which is a continuation of Ser. No. 885,296, Dec. 15, 1969, abandoned. This application Feb. 9, 1977, Ser. No. 767,131
Claims priority, application Switzerland, Dec. 23, 1968, 19148/68
Int. Cl.[2] C09B *45/16, 45/26, 62/08, 62/24*
U.S. Cl. 260—151 9 Claims

1. A chromium-containing complex dyestuff of the formula:



wherein

A_1 represents o-phenylene unsubstituted or substituted by halogen, nitro, lower alkyl, lower alkylsulphonyl, phenylsulphonyl, $—SO_3^-M^+$ or



wherein R_1 represents hydrogen, lower alkyl and R_2 represents hydrogen, lower alkyl or phenyl, or by a cellulosic fiber-reactive group, or o-naphthylene unsubstituted or substituted by $-SO_3^-M^+$,

A_2 represents unsubstituted o-phenylene or o-naphthylene unsubstituted or substituted by hydroxyl or $-SO_3^-M^+$, and

A_3 represents o-phenylene unsubstituted or substituted by halogen, nitro, lower alkyl, lower alkoxy, lower alkylsulphonyl, phenylsulphonyl, $-SO_3^-M^+$— or

wherein R_3 and R_4 independently of each other represent hydrogen or lower alkyl, or o-naphthylene unsubstituted or substituted by nitro, $-SO_3^-M^+$, or both,

B represents 1,2-naphthylene unsubstituted or substituted by halogen, phenylamino, $-COO^-M^+$, $-SO_3^-M^+$, N-lower-alkylsulphamoyl or N,N-di-lower-alkylsulphamoyl; 4-(1-phenyl-3-methyl-pyrazol-5-onyl), 4-(halogenphenyl-, 1-lower-alkyl-sulphonylphenyl- or 1-$SO_3^-M^+$-phenyl-3-methyl-pyrazol-5-onyl) or 4-(1-$SO_3^-M^+$-phenyl-3-methyl-5-amino-pyrazolyl),

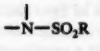
M^+ represents a colorless cation, and

n represents an integer from 1 to 3, and wherein ring G is unsubstituted or substituted by halogen, $-SO_3^-M^+$— or a sulphamoyl,

X_1 represents —O—,

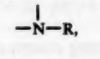
X_2 represents —O—, or —COO—,

X_3 represents —O—, —COO— or

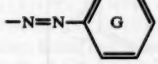


wherein R denotes lower alkyl or phenyl,

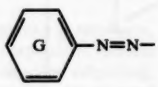
X_4 represents —O—, —NH— or



wherein R has the meaning given in the definition of X_3, and

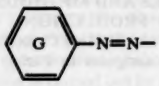


being linked to A_1, A_3 or both and the dyestuff molecule having, in all, from 0 to 3 $-SO_3^-M^+$ groups, and wherein more than one



group is present it is not bound to the same ring A_1, A_3 or B

and when A_1, A_3 or B are unsubstituted or substituted o-phenylene, the



group is bound thereto in the para position with respect to the substituent participating in the chromium complex.

4,086,224

REDUCTION PROCESS FOR MAKING AZO COMPOUND

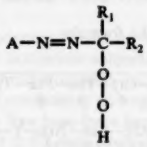
Ronald Edward MacLeay, Williamsville, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Continuation of Ser. No. 526,641, Nov. 26, 1974, abandoned, and a continuation-in-part of Ser. No. 453,451, Mar. 21, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,604

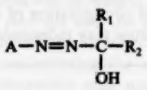
Int. Cl.[2] C07C *107/00, 107/02, 107/04*

U.S. Cl. 260—192 **5 Claims**

1. A process which comprises reacting an α-hydroperoxy azo compound of the formula:



at a temperature above $-10°$ C. and below $+35°$ C. and at a pH of 7 and above with a reducing agent selected from sodium sulfite; potassium iodide; triphenylphosphine; sodium borohydride; sodium thiosulfate; sodium and alcohol; lithium aluminum hydride; aluminum isopropoxide; and hydrogen in the presence of a catalyst selected from Raney nickel, platinum on carbon, platinum oxide and palladium on charcoal; thereby producing an α-hydroxyazo compound having the formula:



wherein in both of said formulae:

A is aryl of 6 to 14 carbons or $(R)_3C$; R is hydrogen; lower alkyl of 1 to 11 carbons; cycloalkyl, bicycloalkyl or tricycloalkyl of 3 to 12 carbons; aralkyl of 7 to 12 carbons; aryl of 6 to 14 carbons; provided that no more than one R is aryl, and the R's and C in $(R)_3C$ taken together form cycloalkyl, bicycloalkyl, or tricycloalkyl of 3 to 12 carbons;

R_1 is hydrogen; alkyl of 1 to 12 carbons; cycloalkyl, bicycloalkyl or tricycloalkyl of 3 to 12 carbons; aralkyl of 7 to 12 carbons;

R_2 is alkyl of 1 to 12 carbons; cycloalkyl, bicycloalkyl, or tricycloalkyl of 3 to 12 carbons; aralkyl of 7 to 12 carbons; aryl of 6 to 14 carbons; and R_1 and R_2 together form alkylene of 3 to 11 carbons.

4,086,225

RIFAMYCIN COMPOUNDS

Leonardo Marsili; Vittorio Rossetti, and Carmine Pasqualucci, all of Milan, Italy, assignors to Archifar Industrie Chimiche del Trentino S.p.A., Rovereto, Italy

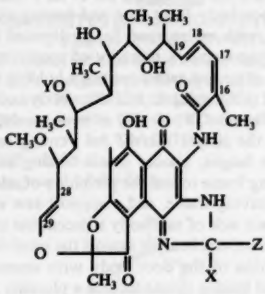
Filed Jun. 10, 1976, Ser. No. 694,589

Claims priority, application Italy, Jun. 13, 1975, 5174A/75

Int. Cl.[2] C07D *498/18*

U.S. Cl. 260—239.3 P **5 Claims**

1. A rifamycin compound having the formula



(I)

wherein X is alkyl having less than 5 carbon atoms; Y is —H or —$COCH_3$; Z is selected from the group consisting of alkyl having less than 5 carbon atoms, alkoxy-alkyl having less than 6 carbon atoms, hydroxy-alkyl having less than 4 carbon atoms, carboxy-alkyl having less than 5 carbon atoms, carbalkoxy-alkyl having less than 6 carbon atoms, halogen-alkyl having less than 4 carbon atoms, N,N-dialkylaminoalkyl having less than 6 carbon atoms, aryl hydrocarbon-alkyl having less than 10 carbon atoms and cycloalkyl having less than 7 carbon atoms; or X and Z, along with the C atom to which they are bonded, form a cyclic moiety selected from the group consisting of a hydrocarbon ring having less than 7 carbon atoms; a hydrocarbon ring having less than 7 carbon atoms which is substituted with at least one radical selected from the group consisting of alkyl having less than 4 carbon atoms, halogen and carbalkoxy having less than 4 carbon atoms; the piperidine ring; and the piperidine ring which is substituted with a radical selected from the group consisting of alkyl having less than 4 carbon atoms, aryl hydrocarbon-alkyl having less than 9 carbon atoms, carbalkoxy having less than 4 carbon atoms and alkanoyl having less than 5 carbon atoms;

16, 17, 18, 19-tetrahydroderivatives thereof; and

16, 17, 18, 19, 28, 29-hexahydroderivatives thereof.

4,086,226

PROCESS FOR THE SYNTHESIS OF THIOLCARBAMATES

Franco Gozzo, Saronno (Varese); Alfredo Rondanelli, and Giorgio Rossi, both of Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

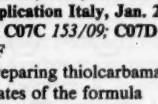
Filed Jan. 27, 1977, Ser. No. 763,135

Claims priority, application Italy, Jan. 28, 1976, 19673 A/76

Int. Cl.² C07C *153/09*; C07D *223/04*

U.S. Cl. 260—239 BF **9 Claims**

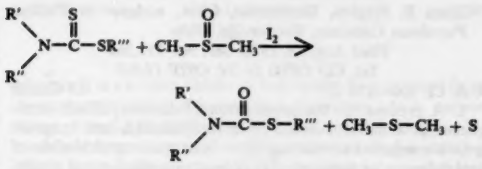
1. A process for preparing thiolcarbamates by desulphurization of dithiocarbamates of the formula



in which

R′ and R″, which may be the same or different, represent alkyls containing from 1 to 9 carbon atoms; halogenated alkyls containing from 1 to 9 carbon atoms; or, together, form an alkylene ring incorporating the N atom of the thiolcarbamate; and

R‴ is an alkyl containing from 1 to 9 carbon atoms; halogenated alkyl containing from 1 to 9 carbon atoms; phenyl; benzyl; substituted phenyl or substituted benzyl wherein the substituents are one or more substituents selected from the group consisting of alkyl, oxy-alkyl and halogen; said process comprising reacting said thiolcarbamates with dimethylsulphoxide, in the presence of iodine as catalyst and at a temperature of from 50° to 200° C, according to the following reaction:



and recovering the thiolcarbamate formed from the reaction mixture.

4,086,227

NOVEL ANTI-DIARRHEAL 4-AZATRICYCLO[4.3.1.1^{3,8}] UNDECANE DERIVATIVES

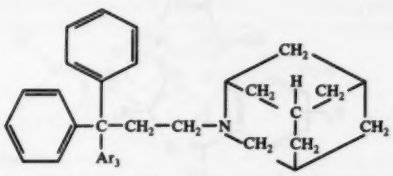
Gilbert W. Adelstein, Evanston; Esam Z. Dajani, Buffalo Grove, and Chung Hwai Yen, Skokie, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 733,503, Oct. 18, 1976, Pat. No. 4,057,549, which is a division of Ser. No. 568,439, Apr. 16, 1975, Pat. No. 3,998,832. This application Aug. 2, 1977, Ser. No. 821,067

Int. Cl.² C07D *223/00, 403/02*

U.S. Cl. 260—239 B **1 Claim**

1. A compound of the formula



and the pharmaceutically acceptable acid addition salts thereof wherein Ar_3 is phenyl or pyridyl.

4,086,228

PROCESS FOR PREPARING CYCLOTETRAMETHYLENETETRANITRAMINE

Irvine J. Solomon, Chicago, Ill., and Louis B. Silberman, Dover, N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,685

Int. Cl.² C07D *257/02*

U.S. Cl. 260—239 HM **7 Claims**

1. In the process of preparing cyclotetramethylenetetranitramine, which comprises reacting hexamine in an acetic acid-acetic anhydride medium with nitric acid-ammonium nitrate nitrating agent in two stages at a temperature between about 40° C and 45° C, characterized in the first reaction stage by the addition of all the hexamine and a minor amount of the nitrating agent and acetic anhydride to a heel consisting essentially of acetic acid-acetic anhydride mixture followed by an optional aging period, and in the second reaction stage by the addition of the remaining, major amount of the nitrating agent and acetic anhydride followed by an aging period, the improvement which comprises the step of incorporating therein

(a) before the addition of said reactants in said first reaction stage, or

(b) after the addition of said reactants in said first reaction stage but before the aging period in said first reaction stage a minor amount up to 0.5 mole of hexamine per mole of hexamine introduced with said nitrating agent.

4,086,229

DINITROSYLDIHALO COMPLEXES OF MOLYBDENUM OR TUNGSTEN

William B. Hughes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1976, Ser. No. 715,261
Int. Cl.[2] C07D *31/24;* C07F *11/00*
U.S. Cl. 260—270 D 33 Claims

1. A process for the preparation of dinitrosyldihalo complexes of a metal selected from molybdenum and tungsten which comprises contacting (I) at least one oxytetrahalide of molybdenum or tungsten, (II) at least one alkali metal nitrite, (III) a reducing agent selected from elemental iron, borohydrides of sodium, potassium, rubidium, and cesium, and mixtures, (IV) at least one ligand-forming compound, and (V) at least one aprotic diluent, employing effective ratios of each material, and employing effective conditions of temperature, pressure, and time.

4,086,230

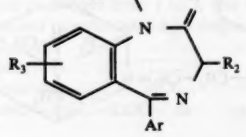
1,5-DIHYDRO-7-ARYL-AS-TRIAZINE[4,3,-α][1,4]BENZODIAZEPIN-1-OLS

Gerald N. Evenson, Cooper Township, Kalamazoo County, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Mar. 9, 1977, Ser. No. 775,887
Int. Cl.[2] A61K *31/55;* C07D *405/06, 487/04*
U.S. Cl. 260—243.3 10 Claims

1. A compound of the formula IV:

IV



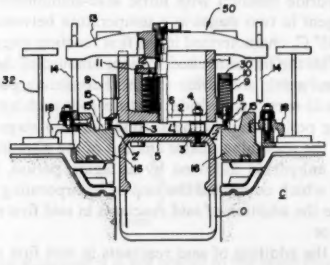
wherein R_1 is alkyl of 1 to 3 carbon atoms, inclusive; wherein R_2 is hydrogen, methyl or ethyl; wherein R_3 is hydrogen, fluoro, chloro, bromo, nitro or $-CF_3$; and wherein Ar is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl, or 2-pyridyl, or the pharmacologically acceptable acid addition salts thereof.

4,086,231

COKE OVEN DOOR CONSTRUCTION

Takatoshi Ikio, 5-32, 1 chome, Senbo, Tobata-ku, Kitakyushu-shi, Japan

Filed Oct. 28, 1975, Ser. No. 626,326
Claims priority, application Japan, Oct. 31, 1974, 49-125996
Int. Cl.[2] C10B *25/16*
U.S. Cl. 202—248 4 Claims



1. A door for a coke oven having an oven opening with a receiving frame extending around the opening, comprising a door body having a front face facing the oven, a sealing plate secured to said door body front face and having an annular peripheral portion with an inturned flange directed inwardly toward the receiving frame, a plurality of spacer means between said sealing plate and said door body holding said sealing plate in spaced relationship to said door body and defining a vent space therebetween, a plurality of vent openings in said door body along the height thereof for venting said space along its complete height, biasing means biasing said flange against the receiving frame to seal the periphery of said plate to the coke oven receiving frame, and a support arm extending outwardly from each side of said body adjacent the upper and lower portions thereof and bearing against the receiving frame to adjust the position of the door body with respect to the frame, wherein said biasing means include a plurality of spring holders carried by said door body, a member movable in each spring holder and engageable with said flange on the exterior thereof, and a spring in each holder biasing said member against said flange.

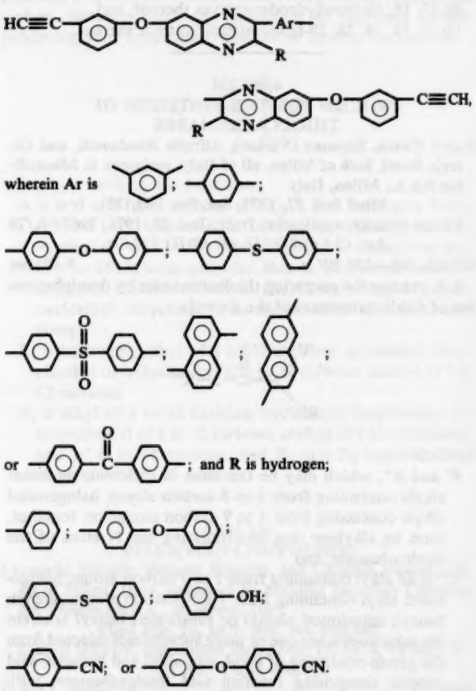
4,086,232

BIS-ETHYNYL HETEROCYCLIC COMPOSITIONS AND METHOD OF SYNTHESIS

Robert F. Kovar, Dayton, and Fred E. Arnold, Centerville, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Division of Ser. No. 612,078, Sep. 10, 1975, Pat. No. 4,022,746.
This application Dec. 23, 1976, Ser. No. 754,042
Int. Cl.[2] C07D *241/42;* C08K *5/34*
U.S. Cl. 260—250 Q 6 Claims

1. A bis-ethynyl quinoxaline compound having the following formula:

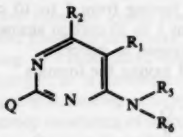


4,086,233
4-(SUBSTITUTED-AMINO)-2-(PYRIDINYL) PYRIMIDINE DERIVATIVES

George Y. Lesher, Schodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 708,195, Jul. 23, 1976, Pat. No. 4,032,523. This application Feb. 3, 1977, Ser. No. 765,234
Int. Cl.[2] C07D *239/42*
U.S. Cl. 260—256.4 C 1 Claim

1. A compound of the formula



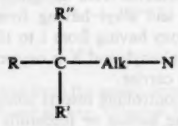
where Q is 4- or 3- or 2-pyridinyl or 4- or 3- or 2-pyridinyl having one or two lower-alkyl substituents or N-oxide thereof, R_1 is hydrogen, lower-alkyl or cyano, R_2 is hydrogen, loweralkyl, hydroxy or halo, R_5 is hydrogen, lower-alkyl or lower-hydroxyalkyl and R_6 is lower-alkyl or lower-hydroxyalkyl.

4,086,234
PROCESS FOR THE PREPARATION OF TERTIARY AMINES

Hugh Latimer Dryden, Jr., and Robert A. Erickson, both of Deerfield, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Nov. 7, 1975, Ser. No. 629,718
Int. Cl.[2] C07D *487/04, 295/14, 211/52*
U.S. Cl. 260—268 BC 10 Claims

1. A process for the preparation of tertiary amines of the general formual



wherein Alk is a lower alkylene radical containing 2 to 6 carbon atoms; R is selected from the group consisting of lower alkyl containing 1 to 6 carbon atoms, phenyl, halophenyl, tolyl and pyridyl; R′ is selected from the group consisting of lower alkyl containing 1 to 6 carbon atoms, phenyl, halophenyl, tolyl, pyridyl, cyano, and hydrogen; R″ is selected from the group consisting of lower alkyl containing 1 to 6 carbon atoms, phenyl, halophenyl, tolyl, pyridyl and hydrogen; or R′ and R″ may together be a doubly bonded oxygen atom or both are alkoxy groups containing 1 to 6 carbon atoms or together are an ethylenedioxy or propylenedioxy group; and

—N

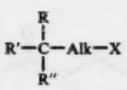
is a cyclic secondary amine radical; which comprises contacting a cyclic secondary amine of the formula

HN

wherein

—N

is defined as hereinabove with a primary alkyl halide of the formula



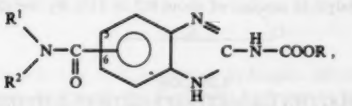
wherein X is a bromo, chloro or iodo atom; R′ is selected from the group consisting of lower alkyl containing 1 to 6 carbon atoms, phenyl, halophenyl, tolyl, pyridyl, cyano, hydrogen; R″ is selected from the group consisting of lower alkyl containing 1 to 6 carbon atoms, phenyl, halophenyl, tolyl, pyridyl and hydrogen; or R′ and R″ are both alkoxy groups containing 1 to 6 carbon atoms or together are a ethylenedioxy or propylenedioxy group; and Alk, and R are defined as hereinabove in a two phase aqueous medium in the presence of an inorganic base acid acceptor, optionally followed by hydrolysis of a ketal to afford the corresponding ketone.

4,086,235
5 (6)-BENZENE RING SUBSTITUTED BENZIMIDAZOLE-2-CARBAMATE DERIVATIVES HAVING ANTHELMINTIC ACTIVITY

Colin C. Beard, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Apr. 12, 1976, Ser. No. 676,443
Int. Cl.[2] A61K *31/415;* C07D *235/32*
U.S. Cl. 424—273 R 14 Claims

1. A compound selected from the group of compounds represented by the formula



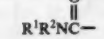
(I)

wherein

R is a lower alkyl group having 1 to 4 carbon atoms;

R^1 is a lower alkenyl group of 3 to 6 carbon atoms having a single carbon to carbon double bond which is not on the α-carbon atom or lower alkynyl group of 3 to 6 carbon atoms having a single carbon to carbon triple bond which is not on the α-carbon atom;

R^2 is hydrogen, R^1, lower alkyl having 1 to 6 carbon atoms, cycloalkyl having 3 to 7 carbon atoms or phenyl; the



substitution being at the 5(6)-position; and the pharmaceutically acceptable salts thereof.

4. A compound chosen from the group consisting of 5(6)-(N,N-diethylcarbamoyl)-2-carbomethoxyaminobenzimidazole and the pharmaceutically acceptable salts thereof.

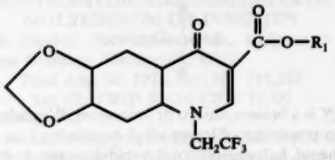
11. The method of controlling helminths in mammals which comprises administering an anthelmintically effective amount of a compound of claim 1.

4,086,236
6,7-METHYLENEDIOXY-1-(2,2,2-TRIFLUOROETHYL)-4(1H)-QUINOLONE-3-CARBOXYLIC ACID

Kyu Tai Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 578,137, May 16, 1975, Pat. No. 4,036,962, which is a continuation-in-part of Ser. No. 496,851, Aug. 12, 1974, abandoned. This application Dec. 6, 1976, Ser. No. 747,732
Int. Cl.[2] C07D *491/04*
U.S. Cl. 260—287 AN 2 Claims

1. A compound of the formula



where

R_1 = H, alkyl of 1–3 carbons or a univalent cation: Na^+, K^+, NH_4^+, Li^+, $\frac{1}{2}Ca^{++}$, $\frac{1}{2}Mg^{++}$.

4,086,237

METHOD OF PREPARING 3-METHYL PYRIDINE

Gerhard Daum, Cologne, and Hermann Richtzenhain, Much-Schwellenbach, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf Bez. Cologne, Germany

Filed Apr. 28, 1976, Ser. No. 681,100

Claims priority, application Germany, May 2, 1975, 2519529

Int. Cl.² C07D *213/06*

U.S. Cl. 260—290 P **9 Claims**

1. Process for production of 3-methyl pyridine comprising contacting a material of the group of 2-methyl-1,5-diaminopentane and a mixture of 2-methyl-1,5-diaminopentane and 3-methyl piperidine with a dehydrogenation catalyst for the reaction at a temperature of 200°–400° C, the catalyst being palladium supported on a suitable support, the support containing the catalyst in amount of about 0.2 to 12% by weight.

4,086,238

1-THIADIAZOLYL-4-METHOXYMETHYL-5-HYDROXYIMIDAZOLIDINONES

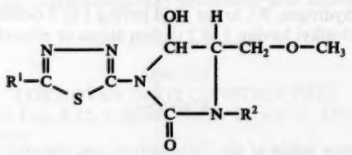
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 21, 1976, Ser. No. 698,248

Int. Cl.² C07D *417/04*

U.S. Cl. 260—306.8 D **9 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower alkylthio,, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl, and R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl and propargyl.

4,086,239

THIAZOLE BIS-PHOSPHATES AND PHOSPHONATES, INTERMEDIATES, AND INSECTICIDAL COMPOSITIONS AND METHODS

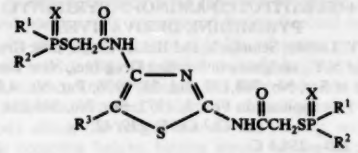
Llewellyn W. Fancher, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jul. 1, 1977, Ser. No. 812,213

Int. Cl.² C07D *277/46*; A61K *31/425*

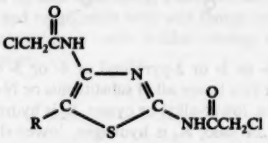
U.S. Cl. 260—306.8 R **45 Claims**

1. A compound having the formula



in which R^1 is selected from the group consisting of methoxy, ethoxy, and alkyl having from 1 to 10 carbon atoms; R^2 is alkoxy having from 1 to 10 carbon atoms; R^3 is hydrogen or phenyl; and X is oxygen or sulfur.

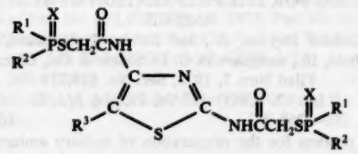
15. A compound having the formula



in which R is hydrogen or phenyl.

18. An insecticidally effective composition of matter comprising

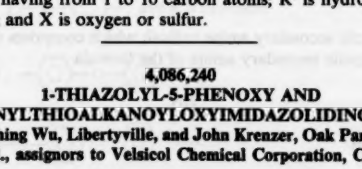
1. an insecticidally effective amount of a compound having the formula



in which R^1 is selected from the group consisting of methoxy, ethoxy, and alkyl having from 1 to 10 carbon atoms; R^2 is alkoxy having from 1 to 10 carbon atoms; R^3 is hydrogen or phenyl; and X is oxygen or sulfur; and

2. an inert diluent carrier.

32. A method of controlling insects comprising applying to said insects or to the habitat or feedstuffs of said insects an insecticidally effective amount of a compound having the formula



in which R^1 is selected from the group consisting of methoxy, ethoxy, and alkyl having from 1 to 10 carbon atoms; R^2 is alkoxy having from 1 to 10 carbon atoms; R^3 is hydrogen or phenyl; and X is oxygen or sulfur.

4,086,240

1-THIAZOLYL-5-PHENOXY AND PHENYLTHIOALKANOYLOXYIMIDAZOLIDINONES

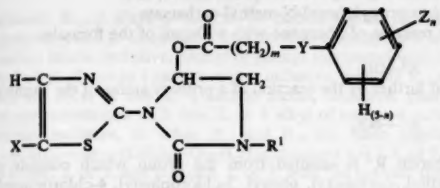
Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 1, 1976, Ser. No. 691,928

Int. Cl.² C07D *417/04*

U.S. Cl. 260—306.8 R **9 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of chlorine, bromine, fluorine and lower alkylsulfonyl; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; m is an integer from 1 to 3; Y is selected from the group consisting of oxygen and sulfur; Z is selected from the group consisting of lower alkyl, lower alkenyl, chlorine, bromine, fluorine, lower haloalkyl, lower alkoxy, lower alkylthio, nitro and cyano; and n is an integer from 0 to 3.

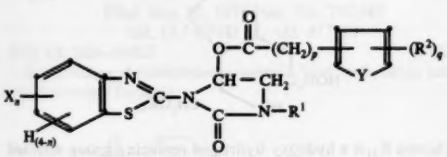
4,086,241

BENZOTHIAZOLYLIMIDAZOLIDINONE ESTERS OF FURYL AND THIENYL SUBSTITUTED ACIDS

Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed Jun. 14, 1976, Ser. No. 695,341
Int. Cl.² C07D *417/04*
U.S. Cl. 260—306.8 D **9 Claims**

1. A compound of the formula



wherein X is selected from the group consisting of lower alkyl, lower haloalkyl, lower alkoxy, chlorine, bromine and iodine; *n* is an integer from 0 to 2; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and

wherein R^3 and R^4 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms; *p* is an integer from 0 to 3; Y is oxygen or sulfur; R^2 is selected from the group consisting of lower alkyl, chlorine bromine and fluorine; and *q* is an integer from 0 to 2.

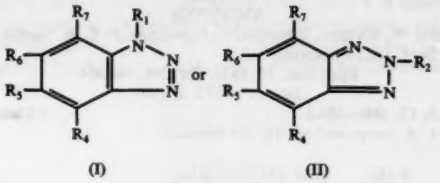
4,086,242

1H- AND 2H-BENZOTRIAZOLES

Robert Eugene Diehl, Lawrenceville, N.J., and Roger Vernon Kendall, Pasadena, Calif., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 490,526, Jul. 22, 1974, abandoned. This application Jan. 12, 1977, Ser. No. 761,098
Int. Cl.² C07D *249/18*
U.S. Cl. 260—308 B **16 Claims**

1. A compound of the formula:

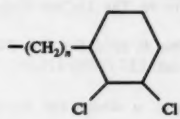


(I) (II)

wherein R_1 and R_2 each independently represent a secondary alkyl C_3–C_7; tertiary alkyl C_4–C_7;

wherein R is C_1–C_2 alkyl; benzyl; cycloalkenyl C_3–C_8; —$(CH_2)_n$-cycloalkyl (C_3–C_8) optionally substituted with a hydroxy, alkoxy C_1–C_3, alkyl C_1–C_3 or

wherein R is C_1–C_2 alkyl and *n* is 0 or 1; cyclohexylone;



where *n* is 0 or 1; R_4 represents hydrogen, chlorine, cyano, methoxy or nitro; R_5 and R_6 are both hydrogen or both methyl; R_7 is hydrogen or nitro; with provisos that when R_4 is nitro, chloro, methoxy or cyano, then R_5, R_6 and R_7 are each hydrogen and when R_4 is hydrogen then R_7 is nitro and R_5 and R_6 are each methyl.

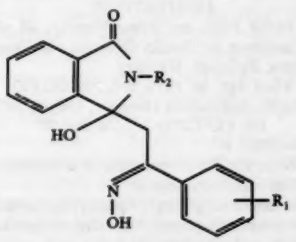
4,086,243

INTERMEDIATES IN THE PREPARATION OF ISOXAZOLYL BENZAMIDES

Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 549,934, Feb. 14, 1975, Pat. No. 3,987,179. This application Jul. 22, 1976, Ser. No. 707,681
Int. Cl.² C07D *209/36, 209/48*
U.S. Cl. 260—325 PH **1 Claim**

1. A compound of the formula



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36, straight chain lower alkyl having 1 to 4 carbon atoms, straight chain lower alkoxy having 1 to 4 carbon atoms, or trifluoromethyl, and

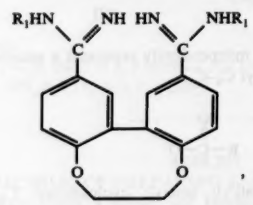
R_2 represents straight chain lower alkyl.

4,086,244
AMIDINES

Peter W. Sprague, Titusville, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 10, 1976, Ser. No. 748,861
Int. Cl.[2] C07D *319/08*
U.S. Cl. 260—340.3 6 Claims

1. A compound having the formula



or a pharmaceutically acceptable salt thereof, wherein R_1 is phenyl or phenyl substituted with one or two methoxy, halogen, or trifluoromethyl groups.

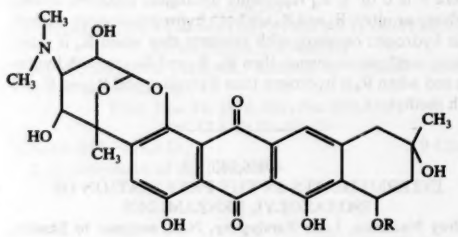
4,086,245
ANTIBIOTICS 7-O-ALKYLNOGAROLS

Paul F. Wiley, Kalamazoo, and David J. Houser, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 9, 1976, Ser. No. 748,716
Int. Cl.[2] C07D *319/08*
U.S. Cl. 260—340.3 5 Claims

1. 7-O-Alkylnogarol, a compound having the following structure:

IV



wherein R is alkyl of from 1 to 4 carbon atoms, inclusive, and isomeric forms thereof.

4,086,246
PROCESS FOR THE PREPARATION OF CARBAMATE DERIVATIVES

Geza Tóth; István Tóth, and Tibor Montay, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara, Budapest, Hungary

Filed Apr. 30, 1976, Ser. No. 682,033
Claims priority, application Hungary, May 6, 1975, CI 1572
Int. Cl.[2] C07D *317/24, 307/87*
U.S. Cl. 260—340.9 R 1 Claim

1. In a process for the preparation of a compound selected from the group which consists of:
2-(1,3-dioxolane-2-yl)-phenyl-N-phenyl-carbamate;
2-(1,3-dioxolane-2-yl)-phenyl-N-methyl-carbamate;
2-(1,3-dioxolane-2-yl)-phenyl-N-3-chlorophenyl-carbamate;
2-(1,3-dioxolane-2-yl)-phenyl-N-cyclohexyl-carbamate;
2-(1,3-dioxolane-2-yl)-phenyl-N-3,4-dichlorophenyl-carbamate;
2-(1,3-dioxolane-2-yl)-phenyl-N-4-chlorophenyl-carbamate;
2,2-dimethyl-2,3-dihydro-benzofuran-7-yl-N-methyl-carbamate;
3-methyl-phenyl-N-methyl-carbamate;
2-chlorophenyl-N-methyl-carbamate; and
4-isopropylphenyl-N-methyl-carbamate
by reaction of phosgene with a phenol of the formula:

$$R^2—OH$$

and further by the reaction of a primary amine of the formula:

$$R^1—NH_2$$

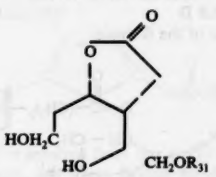
wherein R^1 is selected from the group which consists of methyl, cyclohexyl, phenyl, 3-chlorophenyl, 4-chlorophenyl, and 3,4-dichlorophenyl; and R^2 is selected from the group which consists of 2-(1,3-dioxolane-2-yl)-phenyl, 3-methylphenyl, 2-chlorophenyl, 4-isopropylphenyl, and (2,3-dihydro-2,2-dimethyl-benzofuran-7-yl); the improvement which comprises reacting all three of the abovementioned reactants in a common water-immiscible organic solvent in the same reaction vessel at the same time in the presence of an acid binding agent and with about a 1:1 molar ratio of the phenol to the primary amine to yield the desired product.

4,086,247
3-(1'-HYDROXY-2'-HYDROXYETHYL)-4,6-DIHYDROXYHEXANOIC ACID 4γ LACTONE DERIVATIVES

Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 676,893, Apr. 14, 1976, Pat. No. 4,048,194. This application May 12, 1977, Ser. No. 796,101
Int. Cl.[2] C07D *307/32*
U.S. Cl. 260—343.6 2 Claims

1. A thromboxane intermediate of the formula



wherein R_{31} is a hydroxy-hydrogen replacing group selected from the group consisting of R_9, R_{10}, and R_{34};
wherein R_9 is an acyl protecting group selected from the group consisting of
(a) benzoyl;
(b) benzoyl substituted with one to 5 alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 12 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents are other than alkyl, and that the total number of carbon atoms in the substituents does not exceed 10 carbon atoms, with the further proviso that the substituents are the same or different.
(c) benzoyl substituted with alkoxycarbonyl of 2 to 5 carbon atoms, inclusive;
(d) naphthoyl;
(e) naphthoyl substituted with one to 9, inclusive, alkyl of one to 4 carbon atoms, inclusive, phenylalkyl of 7 to 10 carbon atoms, inclusive, or nitro, with the proviso that not more than 2 substituents on either of the fused aromatic rings are other than alkyl and that the total number of carbon atoms in the substituents on either of the fused aromatic rings does not exceed 10 carbon atoms, with the further proviso that the various substituents are the same or different; and
(f) alkanoyl of 2 to 12 carbon atoms, inclusive; wherein R_{10} is a blocking group selected from the group consisting of
(a) tetrahydropyranyl;
(b) tetrahydrofuranyl; and
(c) a group of the formula

$$—C(OR_{11})(R_{12})\text{-}CH(R_{13})(R_{14}),$$

wherein R_{11} is alkyl of one to 18 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl or phenyl substituted with one to 3 alkyl of one to 4 carbon atoms, inclusive, wherein R_{12} and R_{13} are alkyl of one to 4 carbon atoms, inclusive, phenyl, phenyl substituted with one, 2, or 3 alkyl of one to 4 carbon atoms, inclusive, or when R_{12} and R_{13} are taken together $-(CH_2)_a-$ or $-(CH_2)_b-O-(CH_2)_c$, wherein a is 3, 4, or 5, or b is one, 2, or 3, and c is one, 2, or 3, with the proviso that b plus c is 2, 3, or 4, with the further proviso that R_{12} and R_{13} may be the same or different, and wherein R_{14} is hydrogen or phenyl; wherein R_{34} is an arylmethyl hydroxy-hydrogen replacing group selected from the group consisting of

(a) benzyl,
(b) benzyl substituted by one to five alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive, with the further proviso that the various substituents are the same or different,
(c) benzhydryl,
(d) benzhydryl substituted by one to ten alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylakyl of 7 to 12 carbon atoms, inclusive,
(e) trityl, and
(f) trityl substituted by one to 15 alkyl of one to four carbon atoms, inclusive, chloro, bromo, iodo, fluoro, nitro, phenylalkyl of 7 to 12 carbon atoms, inclusive.

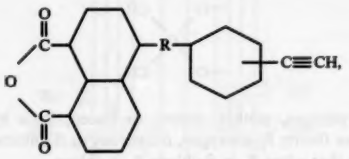
4,086,248

ETHYNYL-SUBSTITUTED AROMATIC ANHYDRIDES

Fred E. Arnold, Centerville, and Frederick L. Hedberg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Dec. 15, 1976, Ser. No. 750,945
Int. Cl.² C07D *311/02, 217/24*
U.S. Cl. 260—345.2 **3 Claims**

1. An ethynyl-substituted aromatic 'peri' anhydride having the following formula:



wherein R is oxygen or sulfur and the ethynyl group is ortho, meta or para to R.

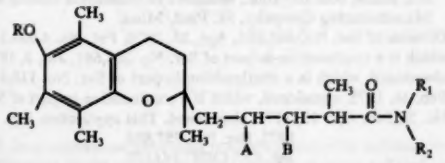
4,086,249

TETRAMETHYL CHROMANYL PENTANE AMIDE

Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 587,570, Jun. 17, 1975, Pat. No. 4,016,178.
This application Dec. 8, 1976, Ser. No. 746,988
Int. Cl.² C07D *311/72*
U.S. Cl. 260—345.5 **4 Claims**

1. A compound of the formula:



wherein A and B are hydrogen or taken together form a carbon to carbon bond; R_1 and R_2 are lower alkyl; R is selected from the group consisting of benzyl, benzhydryl, trityl, t-butyl, tetrahydropyranyl, trimethylsilyl, dimethyl-tertiary-butylsilyl, alpha-loweralkoxyloweralkyl, and 4methyl-5,6-dihydro-2H-pyranyl.

4,086,250

MANUFACTURE OF BICYCLO[2,2,2]OCT-7-ENE 2,3,5,6-TETRACARBOXYLIC ACID DIANHYDRIDE

Heinz Nohe, Meckenheim, and Heinz Hannebaum, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 19, 1976, Ser. No. 743,516
Claims priority, application Germany, Dec. 9, 1975, 2555254
Int. Cl.² C07D *307/93*
U.S. Cl. 260—346.6 **7 Claims**

1. In a process for the manufacture of bicyclo[2,2,2]oct-7-ene-2,3,5,6-tetracarboxylic acid dianhydride by reacting 3,5-cyclohexadiene-1,2-trans-dicarboxylic acid with maleic anhydride in the presence of an anhydride of a low molecular weight alkanecarboxylic acid at from 50° to 150° C, wherein the 3,5-cyclohexadiene-1,2-trans-dicarboxylic acid is heated in the presence of the anhydride of the low molecular weight alkanecarboxylic acid to the reaction temperature and the maleic anhydride is then added, the improvement comprising: carrying out the heating of the 3,5-cyclohexadiene-1,2-trans-dicarboxylic acid and the anhydride of the low molecular weight alkanecarboxylic acid in the presence of from about 0.001 to 2 percent by weight based on the weight of the dicarboxylic acid of a water-soluble salt of an alkali metal, an alkaline earth metal, zinc, manganese or iron, in which salt the anion contains oxygen, and which salt is dissolved in the reaction mixture.

4,086,251

PROCESS FOR MANUFACTURING POLYALKENYL SUCCINIC ANHYDRIDES

John A. Cengel, Wheaton, and Imre Puskas, Glen Ellyn, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 548,382, Feb. 10, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,707
The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.74 **9 Claims**

1. A process for preparing alkenyl-substituted anhydrides by reacting polymers of propene or butene characterized by a number average molecular weight in the range of 200 to 3000 with an intramolecular anhydride chosen from a group consisting of maleic anhydride, citraconic anhydride, itaconic anhydride, ethylmaleic anhydride or halomaleic anhydride, at a mole ratio of 0.8 to 10 of said anhydride to said polymer at a temperature from about 150° C. to about 300° C., which process comprises adding 5–200 ppm based on polymer of a tar and side product suppressing additive to a reaction zone so that the additive is present during the reaction between the polymer and the anhydride, distilling off and condensing unreacted anhydride from the reaction mixture, and returning at least a portion of the recovered anhydride for reaction with said polymer wherein said additive is selected from a group consisting of 1,3-dibromo-5,5-dialkyl substituted hydroantoin whose alkyl-substituents have a total of 2 to 21 carbon atoms, tetra bromomethane, bromotrichloromethane, acetyl bromide, bromoacetyl bromide, benzoyl bromide, N-bromo succinimide, dry hydrogen chloride, calcium bromide and N-bromoacetamide.

4,086,252

PROCESS FOR THE MANUFACTURE OF ANTHRAQUINONE COMPOUNDS

Trevor James Smith, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

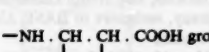
Filed Nov. 8, 1976, Ser. No. 740,022

Claims priority, application United Kingdom, Dec. 10, 1975, 50646/75

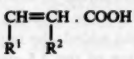
Int. Cl.[2] C07C *49/68;* C09B *1/515*

U.S. Cl. 260—376 8 Claims

1. A process for the production of anthraquinone compounds which contain from 1 to 4



each of which is attached to a carbon atom in an α-position on the anthraquinone nucleus, wherein one of R^1 and R^2 is hydrogen, methyl or ethyl, and the other of R^1 and R^2 is hydrogen, which comprises reacting an anthraquinone compound containing from 1 to 4 primary amino groups each of which is attached to a carbon atom in an α-position on the anthraquinone nucleus with an alkenyl carboxylic acid of the formula



wherein R^1 and R^2 have the meanings stated, in sulphuric acid containing not more than 50% by weight of water, and in the presence of 10 to 100% be weight, which is an amount sufficient to suppress simultaneous production of sulfonate products, based on the weight of the aminoanthraquinone of boric acid, metaboric acid or boric oxide, at a temperature between 20° and 130° C.

4,086,253

3,3',5,5'-TETRA-SUBSTITUTED DIPHENOQUINONE FROM 2,6-DISUBSTITUTED PHENOL BY PHASE-TRANSFER CATALYSIS

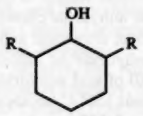
Charles R. Hopper, and Larry D. Kershner, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jul. 8, 1976, Ser. No. 703,481

Int. Cl.[2] C07C *45/16, 49/62*

U.S. Cl. 260—396 N 12 Claims

1. A process of preparing 3,3',5,5'-tetra-substituted diphenoquinone comprising contacting oxygen with a liquid 2,6-disubstituted phenol of the formula



wherein each R is of 1 to about 18 carbon atoms and independently alkyl, alkoxy, aryl or aryloxy in the presence of aqueous strong base and a catalytic amount of an onium salt of the formula $R'R''R'''R^{IV}Q^{\oplus}A^{\ominus}$ wherein $Q^{\oplus}$ is a quaternized nitrogen or phosphorus atom, $A^{\ominus}$ is a neutralizing anion, and R'—R^{IV} are hydrocarbyl groups of 1 to about 16 carbon atoms each with a combined minimum total of about 10 carbon atoms, or any two members of R'—R^{IV} are joined to form a 5- or 6-membered heterocyclic compound, said compound having at least one quaternized nitrogen or phosphorus atom in the ring and said compound having an optional nonadjacent atom of nitrogen, oxygen or sulfur within the ring.

4,086,254

PHOTOCLEAVABLE STEROIDS

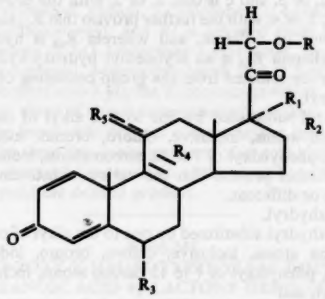
Wendell Wierenga, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 13, 1977, Ser. No. 787,167

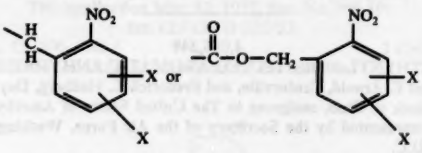
Int. Cl.[2] C07J *5/00*

U.S. Cl. 260—397.45 7 Claims

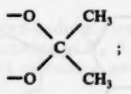
1. A compound of the formula:



wherein R is



X is H, methoxy, bromine, or chloro; R_1 is hydrogen or hydroxy, acyloxy wherein acyl is from 2–8 carbon atoms, inclusive; R_2 is hydrogen, hydroxy, methyl, fluoro, or chloro; and R_1 and R_2 taken together can be



R_3 is hydrogen, methyl, chloro, or fluoro; R_4 is hydrogen, chloro or fluoro; R_5 is oxygen, β-hydroxy or β-chloro with the proviso that when R_5 is β-chloro R_4 is chloro.

4,086,255

PERFLUOROALKYLSULFONAMIDOARYL COMPOUNDS

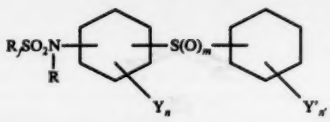
George G. I. Moore, Birchwood, and Joseph Kenneth Harrington, Edina, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 460,883, Apr. 15, 1974, Pat. No. 4,005,141, which is a continuation-in-part of Ser. No. 268,661, Jul. 3, 1972, abandoned, which is a continuation-in-part of Ser. No. 118,476, Feb. 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 28,148, Apr. 13, 1970, abandoned. This application Jan. 10, 1977, Ser. No. 757,883

Int. Cl.[2] C07C *143/75*

U.S. Cl. 260—397.6 16 Claims

1. A compound of the formula



wherein R_f is a lower perfluoroalkyl radical having one or two carbon atoms, R is cyano or

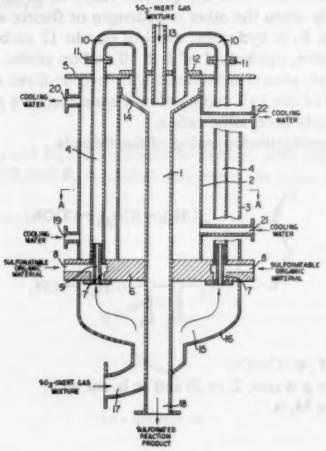
where R′ is alkyl, *m* is 0–2, Y is halogen, alkyl, alkoxy, cyano, nitro, amino, alkanamido, hydroxy, dialkylamino, alkoxycarbamoyl, alkylthio, alkylsulfonyl, alkanoyl, dialkylsulfamoyl or alkylsulfinyl, Y′ is fluorine, alkyl, alkoxy, cyano, nitro, amino, alkanamido, hydroxy, dialkylamino, alkoxycarbamoyl, alkylthio, alkylsulfonyl, alkanoyl, dialkylsulfamoyl or alkylsulfinyl and *n* and *n′* are independently 0–2, provided that the individual aliphatic groups appearing in the R, R′, Y and Y′ moieties contain from one to four carbon atoms each.

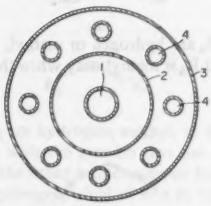
4,086,256

PROCESS FOR SULFONATION

Keiichi Tsuto; Kanji Majima, and Shigeyasu Imamura, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Jul. 12, 1976, Ser. No. 704,613
Claims priority, application Japan, Jul. 21, 1975, 50-89069
Int. Cl.[2] C08H *3/00;* **C07C** *151/02, 143/24*
U.S. Cl. 260—400 **5 Claims**





1. In a continuous gas-liquid reaction process for sulfating or sulfonating liquid organic reactant capable of being sulfated or sulfonated by reaction with gaseous sulfur trioxide, wherein said organic reactant is reacted with gaseous sulfur trioxide to obtain a corresponding sulfated or sulfonated reaction product, wherein said liquid organic reactant is a straight-chain or branched-chain alcohol having 8 to 20 carbon atoms or mixture thereof, the improvement which comprises simultaneously continuously flowing into each of a plurality of separate elongated vertical cylindrical first-stage reaction zones an outer annular stream consisting of said liquid organic reactant and an inner gaseous stream consisting of a mixture of about one to 20% by volume of sulfur trioxide and the balance a gaseous inert diluent, said outer stream being flowed vertically upwardly into the lower end of said first-stage reaction zone, said inner stream being flowed vertically upwardly into said lower end of said first-stage reaction zone, said inner and outer streams flowing in concurrent substantially parallel vertically upwardly directed flow into and through said first-stage reaction zone, said inner and outer streams flowing upwardly through said first-stage reaction zone in gas-liquid contact, said outer stream of liquid reactant forming a continuous thin annular upwardly rising outer liquid film of substantially uniform thickness on the wall of said first-stage reaction zone and extending the entire length thereof, said inner gaseous stream flowing inside of said liquid film upwardly through the entire length of said first-stage reaction zone and having a flow velocity in the range of from about 20 m./sec. to about 120 m./sec., said inner gaseous stream uniformly contacting said annular liquid film over its entire inner surface in said first-stage reaction zone to effect upward movement and mixing of said liquid film whereby the organic reactant and the gaseous sulfur trioxide are mixed and contacted with each other to effect the reaction, and externally cooling said first reaction zone to rapidly extract heat from the resultant reaction mixture as it passes upwardly through said first-stage reaction zone to prevent an excessive increase of the temperature of said reaction mixture in said first-stage reaction zone;

continuously removing said liquid streams and said gas streams from the upper ends of all said first-stage reaction zones and flowing all said streams into the upper end of a single elongated vertical second-stage reaction zone to form a single annular film of said liquid and a single stream of said gas, injecting into said gas from outside the system a second gaseous stream consisting of a mixture of about one to 20% by volume of sulfur trioxide and the balance a gaseous inert diluent, flowing said liquid and gas streams in concurrent substantially parallel vertically downwardly directed flow into and through said second-stage reaction zone, said streams flowing downwardly through said second-stage reaction zone in gas-liquid contact with said stream of liquid reactant forming a continuous thin annular downwardly flowing outer liquid film of substantially uniform thickness on the wall of said second-stage reaction zone and extending the entire length thereof, said gaseous streams flowing inside the liquid film downwardly through the entire length of said second-stage reaction zone and substantially uniformly contacting said annular liquid film whereby the liquid film and the gaseous sulfur trioxide are mixed and contacted with eachother to effect the reaction, and externally cooling said second reaction zone to rapidly extract heat from the resultant reaction mixture as it passes downwardly through said second-stage reaction zone to prevent an excessive increase of the temperature of said reaction mixture in said second-stage reaction zone;

the sum of the amounts of sulfur trioxide supplied to said first-stage reaction zones and said second-stage reaction zone being from 1.0 to 1.1 moles per one mole of said liquid organic reactant fed into said first-stage reaction zones and the amount of sulfur trioxide supplied to said first-stage reaction zones being selected so that the sulfonation or sulfation reaction is from 60 to 95% complete by the time the liquid streams and the gas streams enter said second-stage reaction zone;

separating the liquid phase from the gaseous phase after same have left the bottom of said second-stage reaction

zone and recovering the reaction product from the liquid phase.

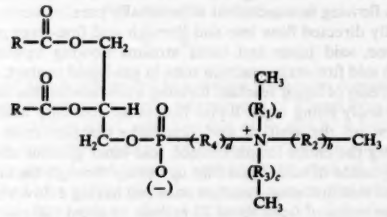
4,086,257

PHOSPHATIDYL QUATERNARY AMMONIUM COMPOUNDS

Barry D. Sears, 43 Bay State Rd., Boston, Mass. 02215

Filed Oct. 12, 1976, Ser. No. 731,132
Int. Cl.[2] A23J 7/00; C07F 9/02
U.S. Cl. 260—403 **11 Claims**

1. A synthetic phosphatidyl quaternary ammonium compound represented by the formula:



wherein R is a C_{14} to C_{20} hydrocarbon radical; *a, b* and *c* represent whole integers of from 0 to 3; *d* represents whole integers of from 1 to 5, except that in combination *a, b* and *c* cannot be zero and *d* cannot be two; and R_1, R_2, R_3 and R_4 are methylene radicals.

10. The compound of claim **1** selected from the group consisting of:

dioleoyl phosphatidyl-(methylethylene-N-triethyl)ammonium;
dipalmitoyl phosphatidyl-(ethylene-N-dimethylethyl)ammonium;
distearoyl phosphatidyl-(ethylene-N-dimethylethyl)ammonium;
oleoyl-palmitoyl phosphatidyl-(ethylene-N-dimethylethyl-)ammonium;
dimyristoyl phosphatidyl-(tetramethylene-N-dipropylmethyl)ammonium;
dipalmitoyl phosphatidyl-(trimethylene-N-trimethyl)ammonium;
egg phosphatidyl-(trimethylene-N-trimethyl)ammonium;
soybean phosphatidyl-(trimethylene-N-trimethyl)ammonium; and
dipalmitoyl phosphatidyl-(tetramethylene-N-trimethylene)ammonium.

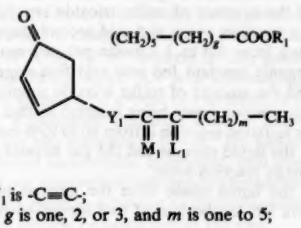
4,086,258

13,14-DIDEHYDRO-PGA$_1$ COMPOUNDS

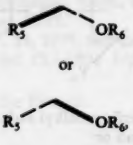
Herman W. Smith, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 658,588, Feb. 17, 1976. This application Dec. 29, 1976, Ser. No. 755,338
Int. Cl.[2] C07C 171/00
U.S. Cl. 260—408 **103 Claims**

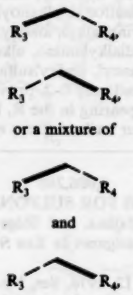
1. A prostaglandin analog of the formula



wherein Y_1 is -C≡C-;
wherein *g* is one, 2, or 3, and *m* is one to 5;
wherein M_1 is

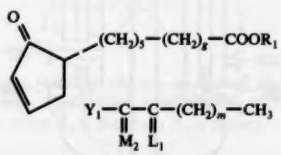


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



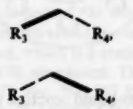
wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with two or three chloro, or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

55. A prostaglandin analog of the formula

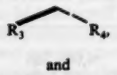


wherein Y_1 is -C≡C-;
wherein *g* is one, 2, or 3, and *m* is one to 5;
wherein M_2 is

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of

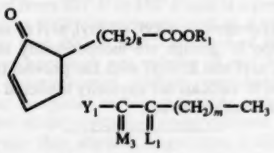


and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with two or three chloro, or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

59. A prostaglandin analog of the formula



wherein Y_1 is -C≡C-;
wherein *m* is one to 5;
wherein M_3 is

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_1 is

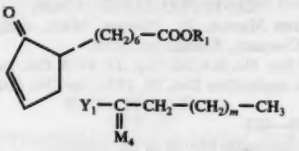
or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fuoro; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with two or three chloro, or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

78. A prostaglandin analog of the formula

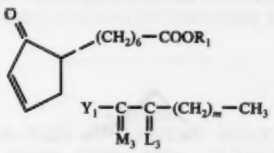


wherein Y_1 is —C≡C—;
wherein m is one to 5, inclusive;
wherein M_4 is

wherein one of R_5 and R_6 is methyl and the other of R_5 and R_6 is hydrogen; and

wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with two or three chloro, or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

85. A prostaglandin analog of the formula



wherein Y_1 is —C≡C—;
wherein m is one to 5;
wherein M_3 is

wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;

wherein L_3 is

or a mixture of

and

wherein one of R_3 and R_4 is methyl or fluoro and the other of R_3 and R_4 is hydrogen, methyl, or fluoro, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and

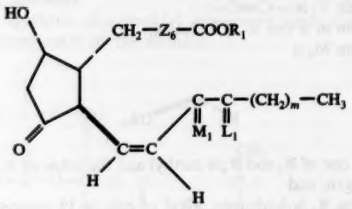
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, phenyl, phenyl substituted with two or three chloro, or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,086,259
CIS-13-PGD$_2$ COMPOUNDS

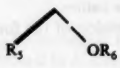
Douglas Ross Morton, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 614,242, Sep. 17, 1975, Pat. No. 4,016,184. This application Dec. 30, 1976, Ser. No. 755,989
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—413 9 Claims

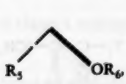
1. A prostaglandin analog of the formula



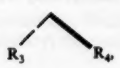
wherein *m* is one to 5, inclusive; wherein M_1 is



or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is



or a mixture of

and

wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation; and
wherein Z_6 is

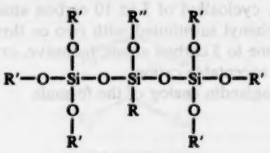
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,
(2) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—, or
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,
wherein g is one, 2, or 3.

4,086,260
ALKOXYSILANE ESTER CLUSTER COMPOUNDS AND THEIR PREPARATION AND USE

Karl O. Knollmueller, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Apr. 27, 1977, Ser. No. 791,359
Int. Cl.[2] C07F *7/04, 7/18*
U.S. Cl. 260—448.8 R 14 Claims

1. A compound having the formula:



wherein R is hydrogen, an alkyl, alkenyl, aryl or aralkyl group, and R" and the R' groups are independently selected from alkyl, alkenyl, aryl and aralkyl with the proviso that at least a majority of the R' radicals are sterically hindered alkyl groups having at least 3 carbon atoms.

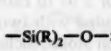
4,086,261
METHANATION OVER SYNTHETIC AMORPHOUS SILICAS

Thomas Owen Mitchell, Trenton, and Darrell Duayne Whitehurst, Titusville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 638,405, Dec. 8, 1975, Pat. No. 4,003,825, which is a division of Ser. No. 450,967, Mar. 14, 1974, Pat. No. 3,983,055. This application Nov. 4, 1976, Ser. No. 738,789
Int. Cl.[2] C07C *1/04*
U.S. Cl. 260—449 M 18 Claims

1. A process comprising (1) contacting a feedstock selected from the group consisting of carbon monoxide and carbon dioxide with a solid catalyst material in the presence of hydrogen and under process conditions including a temperature of from about 250° to about 700° C, a pressure of from about 1 atmosphere to about 150 atmospheres, a gas hourly space velocity, expressed at standard temperature and pressure, of from about 5,000 hr^{-1} to about 100,000 hr^{-1} and a hydrogen/-feedstock mole ratio of from about 1 to about 10 and (2) recovering a product containing methane, said solid catalyst material containing a synthetic amorphous solid prepared by the steps of hydrolyzing and polymerizing at a temperature of up to about 200° C in the presence of water a silane having the formula R(Si)X_3, wherein R is an organic radical selected from the group consisting of alkyl, cycloalkyl, aryl, alkenyl, cycloalkenyl and the said radicals hydroxy-substituted, halogen-substituted and amino-substituted, X is halogen, alkoxy of from 1 to 10 carbon atoms, aryloxy of from 1 to 20 carbon atoms, alkali metaloxy, alkaline earth metaloxy, carboxy or amino and (Si) is selected from the group consisting of

and



and calcining the polymerized product, said silane being admixed with a second component, R'_nMY_m, wherein R' is the same as R, Y is selected from the group consisting of the same groups as X and oxygen, M is selected from the group consisting of iron, nickel, cobalt, platinum, palladium, aluminium and mixtures thereof, *m* is any number greater than 0 and up to 8 and *n* is from 0 to any number less than 8.

4,086,262

CONVERSION OF SYNTHESIS GAS TO HYDROCARBON MIXTURES

Clarence D. Chang, Princeton; William H. Lang, Pennington, both of N.J., and Anthony J. Silvestri, Morrisville, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 724,485, Sep. 20, 1976, abandoned, and Ser. No. 463,711, Apr. 24, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 733,982

Int. Cl.[2] C07C *1/04, 1/16*

U.S. Cl. 260—449.6 R **10 Claims**

1. A method for producing hydrocarbons, which comprises: contacting synthesis gas having a ratio of hydrogen-to-carbon oxides of from 0.2 to 6.0 with a heterogeneous catalyst at a temperature of from 500° F to 850° F and at a pressure of from 1 atmosphere to 1000 atmospheres, and at a volume hourly space velocity from 500 to 50,000 volumes of gas at standard temperature and pressure per volume of said heterogeneous catalyst said heterogeneous catalyst comprising an intimate mixture of an inorganic carbon monoxide reducing catalyst and a selective acidic crystalline aluminosilicate that has pore diameter greater than about 5 Angstroms; a silica-to-alumina ratio of at least 12; a constraint index within the range of 1 to 12; and, recovering hydrocarbons containing quantities of aromatic hydrocarbons.

4,086,263

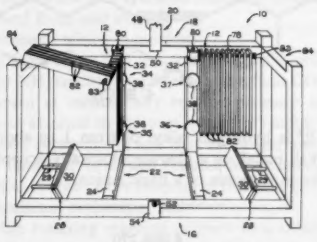
SHIPPING RACK HAVING SPACER STRIPS ATTACHED THERETO

James R. Rowley, Freeport, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 17, 1976, Ser. No. 742,381

Int. Cl.[2] B65D *85/48*

U.S. Cl. 206—454 **16 Claims**



1. In a rack for shipping sheets wherein the rack is of the type having a backwall secured to a base and a pair of runners mounted on the base for shipping the sheets in a generally vertical position with the edge portions of the sheets supported on the runners, the improvement comprising:

a plurality of elongated discrete spacer strips each having a first end and a second end, wherein the first end of each of said spacer strips is to be inserted between adjacent ones of the sheets to be shipped and extends substantially beyond the top edge of each sheet such that adjacent sheets are maintained in spaced relationships to one another;

a rigid rod;

means for mounting said rod on the backwall of the rack; with said rod extending over and spaced from the base of the rack a distance greater than the height of the sheets to be shipped; and

means mounting the second end of each of said spacer strips on said rod for movement toward and away from the base of the rack.

4,086,264

SELF SUPPORTED SKELETAL METAL CATALYSTS AND PROCESS FOR PRODUCING THEM

Clyde S. Brooks; Franklin D. Lemkey, both of Glastonbury, and Gerald S. Golden, Windsor, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Nov. 12, 1976, Ser. No. 741,830

Int. Cl.[2] B01J *21/04, 23/40, 23/74, 35/06*

U.S. Cl. 252—454 **8 Claims**

1. A metallic article having at least one catalytically active surface, comprising:

a. a directionally solidified substrate of substantially eutectic composition, having a microstructure which includes a metallic solid solution matrix and a plurality of single crystal intermetallic fibers, said fibers being oriented generally normal to the catalytic surface;

b. a plurality of porous metallic single crystal fibers of high surface area which protrude from the substrate, each of said fibers being an extension of an intermetallic fiber within the substrate, said porous fibers being comprised predominantly of at least one catalytically active metal.

4,086,265

PREPARATION OF CATECHOL DERIVATIVES

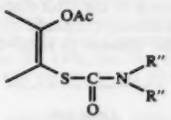
Raymond M. Dodson, Fridley, Minn., and Joseph B. Hanson, Wheaton, Ill., assignors to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Dec. 1, 1976, Ser. No. 746,254

Int. Cl.[2] C07C *153/09, 149/30, 67/08*

U.S. Cl. 260—455 A **15 Claims**

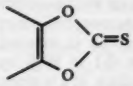
1. A method of preparing catechol derivatives containing the function:



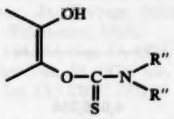
wherein R" is selected from the class consisting of hydrogen and lower alkyl groups, which method comprises:

(A) reacting an aromatic compound containing the catechol function

with thiophosgene to produce a thione having the function



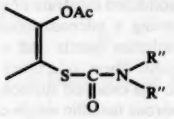
(B) ammonolyzing said thione by reacting with an agent selected from the class consisting of ammonia and lower alkyl amines to form a hydroxyaryl thionocarbamate having the function



wherein R'' is selected from the class consisting of hydrogen and lower alkyl groups,

(C) acetylating said thionocarbamate to form the corresponding acetoxyaryl thionocarbamate, and

(D) heating in the absence of air to about 200° to 260° C for about 20 minutes to 3 hours to rearrange said thionocarbamate to form the corresponding acetoxyaryl thiolcarbamate having the function



4,086,266

METHOD OF BACTERIALLY PURIFYING METHYL CYANOACRYLATE

Harold Corey, Teaneck, N.J., assignor to Population Research Incorporated, Clearwater, Fla.

Filed Apr. 6, 1977, Ser. No. 784,956

Int. Cl.² C07C *121/30*

U.S. Cl. 260—465.4 **9 Claims**

1. The method of providing a bacterially sterile monomer of an aliphatic cyanoacrylate comprising:

(a) preparing a substantially monomeric aliphatic cyanoacrylate that is greater than 99% pure monomer;

(b) providing a sterilized Teflon filter element having a pore size of about 0.20 micrometer;

(c) treating said Teflon filter element by vacuum heating to a temperature of about 100° C to desorb water and substantially all other volatile polymerization catalyst materials from the surface of the filter element; and,

(d) filtering said monomeric aliphatic cyanoacrylate through said Teflon filter element to remove all bacteria therefrom.

4,086,267

COBALT-CATALYZED OXIDATION OF C_3 TO C_7 SATURATED ALIPHATIC HYDROCARBONS TO OXYGENATED PRODUCTS INCLUDING ACETIC ACID

John Stanley Bartlett, Hull; Barry Hudson, Beverley, and John Pennington, Hull, all of England, assignors to BP Chemicals Limited, London, England

Filed Jul. 19, 1976, Ser. No. 706,197

Claims priority, application United Kingdom, Jul. 21, 1975, 30389/75; Sep. 17, 1975, 38180/75

Int. Cl.² C07C *45/02, 51/20, 67/00*

U.S. Cl. 560—241 **7 Claims**

1. In a continuous process for the production of oxygen-containing organic compounds including a substantial proportion of acetic acid by the oxidation of a saturated aliphatic hydrocarbon containing from 3 to 7 carbon atoms or a mixture thereof in a reaction zone with a molecular oxygen-containing gas in the presence of an essentially inert reaction medium and a soluble cobalt catalyst in an amount, calculated as cobalt, within the range from 0.1 to 10% by weight based on the weight of reaction medium, at a temperature in the range from 70° to 150° C and a pressure sufficient to maintain the reactants in the liquid phase, in which a substantially gas-free liquid is withdrawn from the base of said reaction zone and separated into a fraction containing the bulk of said oxygen-containing organic compounds and a fraction consisting of said essentially inert reaction medium with said cobalt catalyst dissolved therein, said latter fraction being recycled to said oxidation zone, the improvement which comprises introducing not less than 5 and not more than 90% of said cobalt catalyst into the reaction zone in the +3 oxidation state.

4,086,268

2-(2-AMINO-4-CHLOROPHENOXY)BENZYL ALCOHOL AND DIACETATE DERIVATIVE

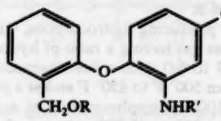
James Jiu, and Seth S. Mizuba, both of Morton Grove, Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Division of Ser. No. 638,711, Dec. 8, 1975, Pat. No. 3,997,401. This application Sep. 20, 1976, Ser. No. 724,510

Int. Cl.² C07C *93/14, 103/38*

U.S. Cl. 560—252 **3 Claims**

1. A compound of the formula



wherein R and R' are both hydrogen atoms or acetyl radicals.

4,086,269

11-DEOXY-15-SUBSTITUTED PROSTAGLANDINS

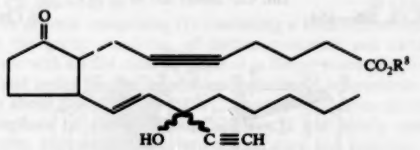
Donald P. Strike, St. Davids, and Wenling Kao, King of Prussia, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 593,821, Jul. 7, 1975, Pat. No. 3,996,255, which is a continuation-in-part of Ser. No. 463,482, Apr. 24, 1974, abandoned. This application Aug. 16, 1976, Ser. No. 714,734

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D **3 Claims**

1. A compound of the formula:



wherein R^8 is hydrogen, alkyl of from 1 to about 6 carbon atoms, alkali metal, or a pharmacologically acceptable cation derived from ammonia or a basic amine.

4,086,270

PROCESS FOR MAKING TEREPHTHALIC ACID

Raymond Wynkoop, and Allen W. Hancock, II, both of Media, Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed Oct. 18, 1976, Ser. No. 733,617

Int. Cl.² C07C *51/08, 63/26*

U.S. Cl. 260—515 P **1 Claim**

1. A process for making terephthalic acid from terephthalonitrile in a distillation reactor system where enhanced ammonia removal is obtained which comprises the steps of:

(a) feeding an aqueous equilibrium hydrolysis solution of terephthalnoitrile to a reactive distillation column operated at a temperature between about 200° and about 260° C. at autogenous pressure, maintaining the molal concentration of aromatics in the aqueous liquid in said column sufficiently high to effect precipitation of dissolved terephthalic acid while subjecting the contents of said reactor to hydrolysis and distillation of ammonia,

(b) removing ammonia and water vapor from the top of said column,

(c) subjecting bottoms product in said column to further hydrolysis and distillation in a reboiler at a temperature of from about 200° to about 260° C. and returning vapors from the reboiler to the column,

(d) removing an aqueous solution of product terephthalic acid containing suspended terephthalic acid solids from the reboiler, and

(e) separating terephthalic acid product low in nitrogen impurities.

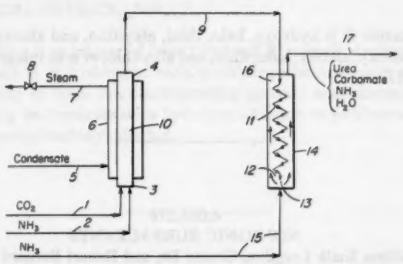
4,086,271
UREA SYNTHESIS WITH IMPROVED HEAT RECOVERY AND CONVERSION

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Division of Ser. No. 190,519, Oct. 19, 1971, Pat. No. 3,952,055. This application Jan. 21, 1976, Ser. No. 650,973

Int. Cl.² C07C *126/00*

U.S. Cl. 260—555 A 5 Claims



1. In a substantially exothermic urea synthesis system wherein fluid NH_3 and fluid CO_2 are contacted at elevated pressure and temperature to form a total urea synthesis mixture in a vertical cylindrical urea synthesis reactor to form urea, and heat is removed from said system,

the improvement which comprises

contacting from about 5 to less than about 100 mol percent of a fluid NH_3 reactor feed stream and a fluid CO_2 reactor feed stream at substantially reactor pressure in a heat exchanger external to the urea synthesis reactor to form ammoinum carbamate in said heat exchanger and simultaneously removing from said external heat exchanger heat of reaction evolved from reaction of NH_3 and CO_2 to form said ammonium carbamate, and

charging the resulting reaction mixture to a conduit positioned in said urea synthesis reactor in a counter current indirect heat exchange relation to a total urea synthesis mixture, defined below, contained in said reactor, wherein the NH_3 to CO_2 molar ratio inside said conduit is maintained at from about 2.2 to about 3.5 to 1, the inlet of said conduit being located at the upper section of said reactor and the outlet of said conduit being located in a bottom section of said reactor,

charging the remaining NH_3 reactor feed stream to the bottom section of the reactor proximate said outlet of said conduit, and

mixing said remaining NH_3 reactor feed stream charged to the bottom section of the reactor with a stream of said resulting mixture discharged from said outlet of said conduit to form a total urea synthesis mixture having a NH_3 to CO_2 molar ratio of from about 2.8 to about 7 to 1 and to maintain a substantially isothermal balance in said reactor.

4,086,272
PHENYL-ALKANOLAMINE, ALKYLAMINE AND ALPHA-AMINOALKYL KETONE DERIVATIVES AS HEART STIMULANTS

David A. Cox, Canterbury; Ian T. Barnish, Ramsgate, and Anthony G. Evans, Westgate-on-Sea, all of England, assignors to Pfizer Inc., New York, N.Y.

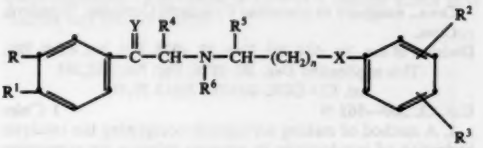
Division of Ser. No. 443,034, Feb. 15, 1974, Pat. No. 3,976,783, which is a division of Ser. No. 160,529, Jul. 7, 1971, Pat. No. 3,816,516. This application Jun. 2, 1976, Ser. No. 691,994

Claims priority, application United Kingdom, Jul. 18, 1970, 34931/70

Int. Cl.² C07C *103/29, 103/38;* A61K *31/165*

U.S. Cl. 260—559 D 12 Claims

1. A compound of the formula:



wherein R and R^1 are each hydrogen or hydroxy with the proviso that at least one is hydroxy; R^2 is hydrogen, alkyl of from 1 to 4 carbon atoms or alkoxy of from 1 to 4 carbon atoms; R^3 is formamido, acetamido, propionamido or carbamoyl, any one of which may be separated from the phenyl ring by a methylene or ethylene group; R^4, R^5 and R^6 are each hydrogen or alkyl of from 1 to 4 carbon atoms; X is oxygen, sulfur, imino or a direct link; Y is hydrogen and hydroxy, two hydrogens or oxygen; *n* is 1 to 3 when X is other than a direct link and is 0 to 4 when X is a direct link; and the pharmaceutically-acceptable acid addition salts.

4,086,273
PROCESS FOR MAKING BETA-AMINOETHYL SULFIDES FROM ALIPHATIC MERCAPTANS AND 2-OXAZOLINES

Sandra Berazosky, and Mark E. Kaiser, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 14, 1976, Ser. No. 676,765

Int. Cl.² C07C *102/00, 85/00*

U.S. Cl. 260—561 S 15 Claims

1. A process for making amides comprising reacting by contacting in liquid phase (a) an aliphatic mercaptan with (b) a 2-oxazoline in the presence of (c) a small but sufficient amount of at least one transition metal salt to catalyze the reaction between (a) and (b); said transition metal salt catalyst being a salt of a metal in groups 1*b*, 2*b*, 6*b*, 7*b*, and 8 and rows 4 and 5 of the Periodic Table of the Elements, inclusive, and is at least partially soluble in the reaction mixture.

4,086,274
N-(2-MERCAPTO-ETHYL)ALKANAMIDES FROM H_2S AND 2-H-2-OXAZOLINES OR 2-ALKYL-2-OXAZOLINES

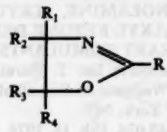
Mark E. Kaiser, and Peter W. Owen, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 589,322, Jun. 23, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,858

Int. Cl.² C07C *102/00, 85/00*

U.S. Cl. 260—561 S 15 Claims

1. A process of preparing a N-(2-mercaptoethyl)alkanamide comprising reacting by contacting under essentially anhydrous conditions (a) a 2-H-2-oxazoline or a 2-alkyl-2-oxazoline of the formula:



in which R is hydrogen or alkyl and R_1–R_4 are each independently hydrogen, lower alkyl, hydroxy-substituted lower alkyl or phenyl, with (b) hydrogen sulfide.

4,086,275

REDUCED COPPER CATALYST ON SUPPORT

Ken Matsuda, and William Austin Barber, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 636,289, Nov. 28, 1975, Pat. No. 4,040,980. This application Dec. 20, 1976, Ser. No. 752,384

Int. Cl.[2] C07C *103/08;* B01J *21/04*

U.S. Cl. 260—561 N **1 Claim**

1. A method of making acrylamide comprising the catalytic hydration of acrylonitrile in aqueous solution by contacting said solution under hydration reaction conditions with copper catalyst supported on a water insoluble, porous catalyst support prepared by:

(a) impregnating said catalyst support with a solution of cuprous compound dissolved in a solvent selected from acetonitrile and acrylonitrile, and

(b) evaporating the solvent from the support, leaving cuprous compound deposited on the support, and

(c) reducing the cuprous compound on the support to copper in situ by contacting the impregnated support with a reducing agent.

4,086,276

ISOMERIZATION OF CYCLOHEXANEBIS(METHYLAMINE) STEREOISOMERS

Walter A. Butte, Jr., West Chester, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Mar. 25, 1977, Ser. No. 781,082

Int. Cl.[2] C07C *83/00*

U.S. Cl. 260—563 R **11 Claims**

1. A process for catalytically isomerizing a cyclohexane bis(methylamine) which comprises contacting said bis-amine with an alkali metal benzene compound at a temperature of from about 100° to about 200° C.

4,086,277

PROCESS FOR PREPARING DIARYLKETONES

Anatoli Onopchenko, Monroeville, and Johann G. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 581,287, May 27, 1975, Pat. No. 4,022,838. This application Feb. 16, 1977, Ser. No. 769,039

The portion of the term of this patent subsequent to May 10, 1994, has been disclaimed.

Int. Cl.[2] C07C *45/02, 76/02*

U.S. Cl. 260—591 **9 Claims**

1. A process for converting a 1,1-diarylalkane selected from the group consisting of 1,1-di(para-tolyl) ethane and 1,1-bis(3,4-dimethylphenyl) ethane to the corresponding diarylketone without appreciably converting the alkyl substituents on the aryl radicals which comprises heating a mixture of said 1,1-diarylalkane, nitric acid and water, the nitric acid having a concentration of about one to about 40 percent, the molar amount of nitric acid, determined as 100 percent nitric acid relative to the molar amount of said 1,1-diarylalkane, being below about 1.5:1 but at least about 0.4:1, wherein the numerical product obtained by multiplying the concentration of nitric acid in said mixture with the ratio of the absolute mols of nitric acid to the mols of said 1,1-diarylalkane in said mixture is in the range of about 1.0 to 150, at a temperature of about 60° to about 200° C. for about one minute to about 24 hours, to obtain a reaction product containing an organic phase and an aqueous phase, separating said phases from each other, and then recovering said desired 1,1-diarylketone from said organic phase.

4,086,278

1-ALKENYL THIOETHERS

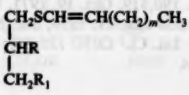
Allen Frederick Hirsch, Somerville, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed Mar. 15, 1976, Ser. No. 666,818

Int. Cl.[2] A61K *31/10;* C07C *149/18, 149/20*

U.S. Cl. 260—609 R **4 Claims**

1. A compound of the formula:



wherein R is hydroxy, halo, thiol, alkylthio, and alkoxy; R_1 is hydroxy, alkoxy, halo, thiol, and alkylthio; *m* is an integer from 0–17.

4,086,279

NONIONIC SURFACTANTS

William Keith Langdon, Grosse Ile, and Robert Bernard Login, Woodhaven, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 547,788, Feb. 7, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 720,952

Int. Cl.[2] C07C *43/02*

U.S. Cl. 260—615 B **2 Claims**

1. A nonionic surfactant material of the formula

$$Z—CH_2—CHZ—CH_2—(—OCH_2—CHZ—CH_2)_n—Z$$

where *n* is an integer from 2 to 29 and each Z is selected from the group consisting of OH and R and 4 to 25 percent of said Z's are R, where R is selected from the groups consisting of

(1) $—OCH_2—CHOH—CH_2—OR^1$, where R^1 is selected from the group consisting of

(a) the long-chain alkyl groups containing 6 to 20 carbon atoms, and

(b) the polyoxyalkylene glycol ether radicals of the formula $(CH_2\text{-}CHR^2—O—)_p—R^3$, where R^2 is selected from the group consisting of hydrogen, methyl and ethyl, *p* is an integer of from 3 to 20, and R^3 is selected from the group consisting of alkyl radicals containing 1 to 6 carbon atoms, the average oxygen/carbon atom ratio of the radical $(CH_2—CHR^2—O)_p$ being not greater than 0.4, and

(2) a divalent radical having the structure $—O—(—CH_2—CHR^2—O—)_q—CH_2—CHOH—CH_2—O—$ in which *q* is an integer from 6 to 40 and R^2 is selected from the group consisting of hydrogen, methyl and ethyl, the average oxygen/carbon atom ratio of the radical $(—CH_2—CHR^2—O)_q$ being not greater than 0.4, each end of said divalent radical functioning as an R in a molecule of the formula $Z—CH_2—CHZ—CH_2—[OCH_2—CHZ—CH_2]_n—Z$.

4,086,280

PROCESS FOR THE PREPARATION OF CYCLOPROPYLCARINYL ALCOHOLS

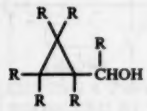
Donald John Peterson, Cincinnati, and Medford Dwight Robbins, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 586,456, Jun. 12, 1975, abandoned, which is a division of Ser. No. 390,156, Aug. 23, 1973, Pat. No. 3,959,324, which is a continuation-in-part of Ser. No. 247,641, Apr. 26, 1972, abandoned. This application Jun. 24, 1976, Ser. No. 699,404

Int. Cl.[2] C07C *29/00*

U.S. Cl. 260—617 R 5 Claims

1. A process for preparing cyclopropylcarbinyl alcohol of the formula



wherein each R is hydrogen, comprising admixing an organotin compound of the formula

$$(CR_2{=}CRCR_2CR_2)_xSnR_{4-x}{}^1$$

wherein x is an integer of from 1 to 4 and R^1 is an alkyl substituent, and R is hydrogen, with m-chloroperbenzoic acid and warming to form the corresponding epoxide and, thereafter reacting said epoxide with hydrogen chloride to produce said cyclopropylcarbinyl alcohol.

4,086,281

PROCESS FOR PRODUCING MONO-SUBSTITUTED ALKYLRESORCINOL ISOMERS

Samuel N. Holter, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 564,785, Apr. 3, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,477

Int. Cl.[2] C07C *39/08*

U.S. Cl. 260—621 R 10 Claims

1. A process for producing simultaneously the mono-substituted 2-, 4-, and 5-alkylresorcinol isomers, to obtain predominantly the 5-alkylresorcinol isomer along with lesser amounts of the 2- and 4-alkylresorcinol isomer, comprising:

a. reacting an aliphatic alcohol having 1 to 3 carbon atoms selected from the group consisting of; methanol, ethanol, propanol and isopropanol and allyl alcohol and propargyl alcohol and halogenated and nitrated derivates thereof with resorcinol at a molar ratio in the range of greater than 1:1 to 3:1 in the vapor phase at a temperature in the range of about 350° C to around 415° C and in the presence of an acidic catalyst selected from the group consisting of acid activated clays, activated bauxite, alumina, silica-alumina and Friedel-Crafts catalyst under the pressure of at lest atmospheric pressure and for a reaction time until the quantity of 5-alkylresorcinol reaches a maximum whereby a mixture of mono-substituted alkylresorcinol isomers and some other alkylated hydroxy aromatic compounds and some unreacted resorcinol is produced; and

b. separating the mono-substituted 2-, 4-, and 5-alkylresorcinol isomers from the other alkylated compounds and unreacted resorcinol in the mixture to obtain predominantly 5-alkylresorcinol and lesser amounts of 2-alkylresorcinol and 4-alkylresorcinol.

4,086,282

PROCESS FOR PREPARATION OF 3,5-XYLENOL

Freddy Wattimena, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 29, 1976, Ser. No. 681,358

Int. Cl.[2] C07C *37/06*

U.S. Cl. 260—621 H 7 Claims

1. A process for the preparation of 3,5-xylenol from isophorone which comprises heating isophorone at a temperature of from about 450° to about 650° C in the presence of a homogeneous catalyst selected from the class consisting of a halogen having an atomic number of at least 17 and an organic compound containing said halogen, said halogen being selected from the class consisting of molecular chlorine, bromine and iodine and said organic compound being selected from the class consisting of haloalkanes of 1 to 6 carbon atoms allyl halides and phenyl halides.

4,086,283

PROCESS FOR PREPARING THYMOL

Wolfgang Biedermann; Horst Köller, both of Krefeld, and Karlfried Wedemeyer, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jun. 2, 1976, Ser. No. 692,170

Claims priority, application Germany, Jun. 25, 1975, 2528303

Int. Cl.[2] C07C *39/06*

U.S. Cl. 260—626 T 5 Claims

1. In a process for the preparation of thymol by reacting m-cresol with propylene and/or compounds which eliminate propylene in the presence of an aluminum oxide catalyst the improvement comprising carrying out said process continuously and this in the presence of 10 to 1000 ppm of a nitrogen base selected from the group consisting of ammonia, hydrazine, alkyl, dialkyl or hydroxyalkyl amines having up to four carbon atoms in the alkyl group, cycloalkyl amines having 6–12 carbon atoms, benzylamine, aniline, dimethylaniline, pyridine, piperidine, and urea at temperatures of 200° to 400° C and at pressures up to about 100 bars.

4,086,284

ISOMERIZATION OF ENDO-TETRAHYDRODICYCLOPENTADIENE TO A MISSILE FUEL DILUENT

Abraham Schneider, Overbrook Hills; Richard E. Ware, Aston, and Edward J. Janoski, Havertown, all of Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed Sep. 3, 1976, Ser. No. 720,307

Int. Cl.[2] C07C *1/00*

U.S. Cl. 260—666 PY 10 Claims

1. Process for isomerizing endo-tetrahydrodicyclopentadiene comprising:

(a) contacting endo-tetrahydrodicyclopentadiene with anhydrous aluminum trichloride wherein the mole ratio of aluminum trichloride to the tetrahydrodiene is in the range between from about 0.001 to about 0.75 and the temperature of the contacting is in the range between from about −20° C to about 90° C;

(b) continuing said contacting until at least 70% of the endo-tetrahydrodicyclopentadiene is isomerized to exo-tetrahydrodicyclopentadiene; and

(c) recovering resulting product.

4,086,285

TRICYCLO[6.2.1.0^{2,6}]UNDECA-2(6)-ENE AND PROCESS FOR HYDRIDE TRANSFER REDUCTION REARRANGEMENT OF SAME

Yoshiaki Inamoto, Wakayama; Kiyoshi Tsuchihashi, Kainan; Naotake Takaishi, Wakayama; Yoshiaki Fujikura, Wakayama, and Koji Aigami, Wakayama, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1976, Ser. No. 734,365
Claims priority, application Japan, Nov. 7, 1975, 50-133894
Int. Cl.^{2} C07C *13/28*
U.S. Cl. 260—666 PY 2 Claims

1. Tricyclo[6.2.1.0^{2,6}]undeca-2(6)-ene.

4,086,286

ISOMERIZATION OF TETRAHYDROPOLYCYCLOPENTADIENES TO A MISSILE FUEL ADDITIVE

Edward J. Janoski, Havertown; Abraham Schneider, Overbrook Hills, and Richard E. Ware, Aston, all of Pa., assignors to Suntech, Inc., Wayne, Pa.

Filed Sep. 3, 1976, Ser. No. 720,306
Int. Cl.^{2} C07C *1/00*
U.S. Cl. 260—666 PY 7 Claims

1. Process for the isomerization of tetrahydropolycyclopentadiene comprising:

(a) contacting a tetrahydropolycyclopentadiene mixture consisting of at least two of the following: endotetrahydrodicyclopentadiene, tetrahydrotricyclopentadiene, tetrahydrotetracyclopentadiene, and tetrahydropentacyclopentadiene; with anhydrous aluminum trichloride wherein the weight ratio of the amount of the aluminum trichloride to the tetrahydropolycyclopentadiene mixture ranges between from about 0.005 to about 0.75, and with anhydrous hydrogen chloride in an amount effective to accelerate the reaction and in the presence of a inert chlorinated paraffin solvent at a temperature in the range between from about −20° C to about 25° C;

(b) continuing the contacting unit isomerization of the mixture is sufficient to form a high density missile fuel or a high density missile fuel additive; and

(c) recovering the resulting high density missile fuel or a high density missile fuel additive.

4,086,287

SELECTIVE ETHYLATION OF MONO ALKYL BENZENES

Warren W. Kaeding, Westfield, and Lewis B. Young, Kendall Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 19, 1976, Ser. No. 706,981
Int. Cl.^{2} C07C *3/52*
U.S. Cl. 260—671 R 15 Claims

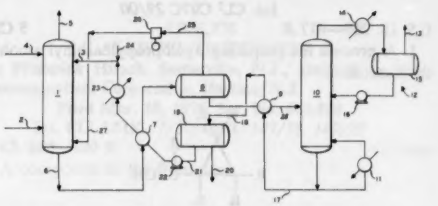
1. Process for effecting ethylation of a mono alkyl benzene wherein the alkyl substituent contains 1 or 2 carbon atoms which comprises contacting said mono alkyl benzene, under conversion conditions, with ethylene in the presence of a catalyst comprising a crystalline aluminosilicate zeolite, which zeolite is characterized by an activity, in terms of alpha value of between about 2 and about 5000, a xylene sorption capacity greater than 1 gram/100 grams of zeolite and an ortho xylene sorption time for 30 percent of said capacity of greater than 10 minutes, said sorption capacity and sorption time being measured at 120° C. and a xylene pressure of 4.5 ± 0.8 mm. of mercury, said crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12 to yield a resulting product in which the para ethyl derivative of said mono alkyl benzene is present in an amount greater than the thermodynamic equilibrium concentration thereof in the total dialkyl substituted benzenes produced.

4,086,288

ACETYLENES REMOVAL FROM OLEFIN STREAMS FOR ALKYLATION BY DIMETHYL FORMAMIDE ABSORPTION

Howard B. Irvin; Fred T. Sherk, and Alfred A. Hoffman, Jr., all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 16, 1976, Ser. No. 714,934
Int. Cl.^{2} C07C *3/00, 11/00*
U.S. Cl. 260—671 R 4 Claims



1. A process for the removal of acetylenes from acetylene-containing gases comprising:

(a) extracting a gas containing an olefin selected from the group consisting of ethylene, propylene, butylene, and mixtures thereof and acetylenes with liquid dimethyl formamide in an extraction zone,

(b) injecting a liquid hydrocarbon selected from the group consisting of paraffinic hydrocarbons having 4–8 carbon atoms per molecule and containing at least one tertiary carbon atom per molecule and aromatic hydrocarbons having 6–10 carbon atoms per molecule into said extraction zone at a location above the feed inlet for the dimethyl formamide, and

(c) withdrawing a gaseous effluent stream from said extraction zone comprising said olefin and said hydrocarbon and being essentially acetylene-free and introducing at least a portion of said gaseous effluent into an alkylation zone and reacting said olefin and said hydrocarbon in the presence of an alkylation catalyst to form an alkylate in said alkylation zone.

4,086,289

MANUFACTURE OF XYLENES

Walter H. Seitzer, West Chester, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed Jul. 5, 1977, Ser. No. 813,158
Int. Cl.^{2} C07C *3/52*
U.S. Cl. 260—671 M 3 Claims

1. In the process of methylating toluene to obtain a mixture of xylenes relatively low in the meta-isomer and low in ethyl benzene content by contacting toluene with hydrogen and a carbon oxide-containing gas in the presence of a catalyst, the improvement of using as catalyst zinc chromite mixed with an alkali metal exchanged molecular sieve containing a stoichiometric excess of an alkali metal carbonate.

4,086,290

OXIDATIVE DEHYDROGENATION PROCESS

Robert S. Cichowski, San Luis Obispo, Calif., and Floyd E. Farha, Jr., Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 542,006, Jan. 17, 1975, Pat. No. 3,993,591, which is a division of Ser. No. 264,932, Jun. 21, 1972, Pat. No. 3,870,764. This application Jun. 24, 1976, Ser. No. 699,729
Int. Cl.^{2} C07C *11/12*
U.S. Cl. 260—680 E 27 Claims

1. A process of oxidative dehydrogenation of at least one dehydrogenatable organic compound containing at least one

grouping which comprises contacting said dehydrogenatable organic compound under oxidative dehydrogenation conditions with molecular oxygen and a catalyst consisting essentially of (I) about 15 to 45 weight percent iron, (II) about 15 to 40 weight percent phosphorus, and (III) about 0.1 to 10 weight percent of a promoter which is boron, aluminum, indium, or thallium, and (IV) oxygen, wherein the weight percents are based on the total composition exclusive of support, if any.

4,086,291

METHOD OF PRODUCING A PAVING MASS AND A PAVING MASS PRODUCED BY THE METHOD

Assar Natanael Svensson, Ersmark, Sweden, assignor to Skega AB, Ersmark, Sweden

Continuation of Ser. No. 134,403, Apr. 15, 1971, abandoned. This application Apr. 14, 1976, Ser. No. 676,955
Int. Cl.[2] C08L 7/00
U.S. Cl. 260—758 3 Claims

1. In the known method for producing a paving mass which contains macadam, rubber vulcanizate, a filling material and a binding material in the nature of asphalt, the improvement which comprises:

(a) heating the macadam to a temperature of 160° - 170° C,

(b) adding solid particles of rubber vulcanizate to said heated macadam, said particles having a dimension of between 1 and 8 mm measured in the direction of greatest particle dimension,

(c) mixing said heated macadam and said solid particles of rubber vulcanizate of step (b) together for a time sufficient for said rubber vulcanizate particles to adhere to said heated macadam,

(d) thereafter adding to the product of step (c) particles of rubber vulcanizate having a size less than 1 mm and effecting mixing thereof with the product of step (c), and

(e) mixing the product of step (d) with both a filling material and a binding material to thereby produce a paving mass.

4,086,292

SURFACE-COATING BINDERS

Fritz Erdmann Kempter, Mannheim; Heinrich Hartmann, and Herbert Spoor, both of Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 12, 1976, Ser. No. 713,786
Claims priority, application Germany, Sep. 19, 1975, 2541801
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—831 12 Claims

1. A surface-coating binder which is substantially free from epoxide groups and is obtained by reacting

(a) 15 to 80% by weight of Mannich bases obtained from

(a_1) condensed phenols,

(a_2) secondary amines which contain at least one hydroxyalkyl group and

(a_3) formaldehyde with

(B) 85 to 20% by weight of epoxy resins having an epoxide value of from 0.15 to 0.6, which are virtually free from free isocyanate groups, carry blocked isocyanate groups and are prepared by the reaction of hydroxy-containing epoxy resins with partially blocked diisocyanates.

4,086,293

LOW ENERGY-CURABLE HIGH SOLIDS COATING COMPOSITIONS

Oliver Wendell Smith, South Charleston, and Joseph Victor Koleske, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,279
Int. Cl.[2] C08L 63/00
U.S. Cl. 260—830 R 22 Claims

1. A high solids coating composition comprising (I) from 20 to 60 weight percent of a polycaprolactone derivative and (II) from 80 to 50 weight percent of a polyepoxide; said percentages based on the combined weights of components (I) and (II); and wherein said component (I) comprises a water insoluble, carboxyl modified polycaprolactone adduct reaction product mixture produced by the reaction of (i) a polycaprolactone polyol and (ii) from 0.5 to 1 carboxylic acid anhydride equivalent for each hydroxyl equivalent present in said polycaprolactone polyol of an intramolecular anhydride of a polycarboxylic acid; and (III) a catalytic amount of catalyst sufficient to catalyze the reaction of the oxirane group with the carboxyl group.

4,086,294

POLYCAPROLACTONE-EPOXIDE ADDUCTS AND COATING COMPOSITIONS THEREOF

Joseph Victor Koleske, Charleston, and Oliver Wendell Smith, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 26, 1976, Ser. No. 690,283
Int. Cl.[2] C08G 63/76, 63/02; C08L 67/04
U.S. Cl. 260—834 56 Claims

1. A water insoluble polycaprolactone-epoxide adduct comprising the reaction product mixture of a polycaprolactone polyol, a diepoxide and an anhydride of a polycarboxylic acid, said water insoluble polycaprolactone-epoxide adduct reaction product mixture produced by a process selected from the group consisting of Route 1 or Route 2, wherein Route 1 comprises the steps of

(i) reacting a polycaprolactone polyol having at least two hydroxyl groups in the molecule, a hydroxyl number of from about 15 to about 600 and an average molecular weight of from 290 to about 6000 with a diepoxide to produce a water insoluble polycaprolactone-epoxide intermediate, and then

(ii) reacting the intermediate of (i) with an intramolecular anhydride of a polycarboxylic acid to produce said water insoluble polycaprolactone-epoxide adduct reaction product mixture,

and wherein Route 2 comprises the steps of

(i) reacting a polycaprolactone polyol having at least two hydroxyl groups in the molecule, a hydroxyl number of from about 15 to about 600 and an average molecular weight of from 290 to about 6000 with an intra-molecular anhydride of a polycarboxylic acid to produce a water insoluble polycaprolactone adduct intermediate, and then

(ii) reacting the intermediate of (i) with a diepoxide to produce said water insoluble polycaprolactone-epoxide adduct reaction product mixture and wherein there is used from 0.1 to about 0.5 anhydride equivalent for each unreacted hydroxyl equivalent or group initially present in the polycaprolactone polyol or formed in the polycaprolactone-epoxide adduct.

4,086,295

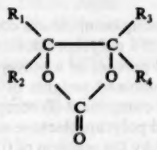
POLYAMIDE COMPOSITION

Taketoshi Mori; Susumu Goto; Asaichi Katsuragi, and Mutsuo Matsuki, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1976, Ser. No. 751,925
Int. Cl.[2] C08L 77/00
U.S. Cl. 260—857 L 17 Claims

1. A high impact strength polyamide composition comprised

of 65–95 parts by weight of polyamide; 35–5 parts by weight of an ethylene series copolymer of ethylenic hydrocarbon and unsaturated carboxylic acid, wherein a part of the carboxyl groups on the acid has been converted into metal salts thereof; and 0.1–5 parts by weight of at least one compound selected from the group consisting of a monoepoxy compound and a carbonate compound of the formula:



wherein R_1, R_2, R_3 and $R_4$are the same or different and each stands for a hydrogen atom or an alkyl group per 100 parts by weight of total quantity of said polyamide and ethylene series copolymer.

4,086,296

BLENDS OF THERMOPLASTIC POLYMER WITH A MULTI-PHASE ACRYLIC COMPOSITE POLYMERS

Daniel T. Carty, Willingboro, N.J., and James A. Oline, Wyncote, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 299,492, Oct. 20, 1972, Pat. No. 3,859,384, which is a continuation-in-part of Ser. No. 108,177, Jan. 20, 1971, abandoned, which is a continuation-in-part of Ser. No. 55,979, Jul. 17, 1970, abandoned. This application Dec. 13, 1974, Ser. No. 532,350

The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.

Int. Cl.² C08L *77/00;* C08F *15/00*

U.S. Cl. 260—857 G **12 Claims**

1. A composition comprising a blend of a thermoplastic polymer other than vinyl halide polymers with a multiphase acrylic composite polymer which is solid at room temperature and which comprises:

(A) about 50 to 90 weight percent of a first noncrosslinked phase of viscosity average molecular weight of about 7,500 to 50,000 polymerized from a first monomer emulsion of at least 25 weight percent of at least one alkyl acrylate wherein said alkyl group has 1 to 18 carbon atoms, and 0 to 75 percent of another copolymerizable ethylenically unsaturated monomer; and

(B) about 10 to 50 weight percent of a final, rigid thermoplastic phase polymerized in the presence of said first phase from an emulsion or solution of about 35 to 100 weight percent of at least one monomer which is a methacrylate, acrylate, styrene or substituted styrene, 0 to 65 weight percent of another acrylic monomer and 0 to 65 weight percent of another copolymerizable ethylenically unsaturated monomer, wherein the rigid thermoplastic phase has a viscosity average molecular weight of from about 400,000 to 5×10^6.

4,086,297

METHOD OF MAKING POLYMERIC COMPOSITIONS AND COMPOSITIONS THEREFOR

Nuno M. Rei, Peabody, and Nicholas J. Hill, Andover, both of Mass., assignors to Ventron Corporation, Beverly, Mass.

Continuation-in-part of Ser. No. 635,755, Nov. 28, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 736,968

Int. Cl.² C08K *5/43, 5/39, 5/34, 5/53*

U.S. Cl. 260—859 PV **42 Claims**

38. A thermoplastic resin composition resistant to microbiological degradation comprising between about 0.5 and 5.0 weight percent of a composition comprising vinyl chloridefevinyl acetate copolymer and between 1 and 80 weight percent of a first microbiocide at a concentration of at least 20 times greater than the normal upper usage concentration of the microbiocide.

wherein said first composition is homogeneously dispersed in a second thermosplastic resin composition comprising a thermoplastic resin which is not a vinyl chloride-vinyl acetate copolymer.

4,086,298

BRANCHED BLOCK COPOLYMERS AND THEIR MANUFACTURE

Gerhard Fahrbach, Plankstadt; Karl Gerberding; Erhard Seiler, both of Ludwigshafen, and Dieter Stein, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 15, 1976, Ser. No. 732,890

Claims priority, application Germany, Nov. 8, 1975, 2550226

Int. Cl.² C08F *297/04*

U.S. Cl. 260—880 B **10 Claims**

1. Branched block copolymers of from 60 to 95 percent by weight of a monovinyl-aromatic compound and from 40 to 5 percent by weight of a conjugated diene of 4 to 8 carbon atoms, which have an average structure of the general formula

$$(A^1—B\rightarrow A^2)_n—X—(A^2\leftarrow B)_m$$

where A^1 and A^2 are non-elastomeric polymer segments based on the monovinyl-aromatic compound and the B's are elastomeric polymer segments based on the conjugated diene, n and m are numbers, m being equal to or greater than n and the sum of m and n being at least 3, and X is the radical of the polyfunctional coupling agent by means of which the linear polymer blocks ($A^1—B\rightarrow A^2$) and ($B\rightarrow A^2$), which form the branches, are chemically bonded to one another at the polymer segments A^2, with the provisos that the polymer segment or segments A^1 contains or contain from 50 to 80 percent by weight of the total monovinyl-aromatic compound of the branched block copolymer, as copolymerized units, the transition between the polymer segments A^1 and B is sharp and the transition between the polymer segments B and A^2 is gradual.

4,086,299

COPOLYMERS OF AN ALLYLAMINE GRAFTED ONTO AN UNSATURATED BENZOIN COPOLYMER

Mervyn Benjamin Jackson, West Brunswick, and Wolfgang Hermann Fritz Sasse, East Malvern, both of Australia, assignors to ICI Australia Limited, Melbourne and Commonwealth Scientific and Industrial Research Organization, Campbell, both of, Australia

Filed May 17, 1976, Ser. No. 687,323

Claims priority, application Australia, Jun. 4, 1975, 1877/75

Int. Cl.² C08L *31/02*

U.S. Cl. 260—885 **11 Claims**

1. A resin comprising a copolymer of an unsaturated benzoin or unsaturated benzoin alkyl ether and an ester of an unsaturated carboxylic acid, said copolymer having grafted onto it an allylamine and wherein the molar ratio of benzoin derivative to acid derivative is in the range 0.5:99.5 to 20:80.

4,086,300

ACRYLIC MODIFIERS FOR POLYCARBONAMIDES

Frederick H. Owens, Willingboro, N.J., and James S. Clovis, Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 71,228, Sep. 10, 1970, Pat. No. 3,668,274. This application Dec. 13, 1971, Ser. No. 207,643

Int. Cl.² C08L *31/02*

U.S. Cl. 260—885 **9 Claims**

1. A multi-phase polymer for modifying polycarbonamides prepared by emulsion polymerization comprising (A) a first elastomeric phase having a glass temperature less than 25° C. and polymerized from monomers comprising a major amount of an alkyl acrylate, a polyunsaturated cross-linking monomer

having a plurality of addition polymerizable unsaturated groups, each of which participate in the polymerization reaction at about the same rate as one another, a graft-linking monomer having two or more addition polymerizable unsaturated reactive groups which participate in the polymerization reaction at substantially different rates, and (B) a final rigid phase having a glass temperature above 50° C. and containing amine-reactive carboxylic acid groups and polymerized from monomers comprising a major amount of an alkyl acrylate and a minor amount of a copolymerizable carboxylic acid.

4,086,301

HEAT-SEALABLE VULCANIZATES COMPRISING POLYOLEFIN RUBBER AND PROPYLENE POLYMER

Dieter Zerpner, Oer-Erkenschwick; Klaus Zur Nedden, Marl; Albert Frese, Marl, and Hans Datene, Marl, all of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed May 3, 1976, Ser. No. 682,402

Claims priority, application Germany, May 6, 1975, 25200

Int. Cl.² C08L *23/16*

U.S. Cl. 260—897 A **9 Claims**

1. In a heat-sealable polyolefin elastomer vulcanizate comprising:

(a) a polyolefin elastomer selected from the group consisting of EP copolymers of ethylene with at least one of propylene and butene-1, and EPDM copolymers of ethylene and at least one of propylene and butene-1 with an unconjugated diene, and

(b) a cross-linking amount of an elastomer cross-linking agent, the improvement which comprises:

5–100 parts by weight, based on said polyolefin elastomer, of a propylene polymer uniformly admixed therewith prior to vulcanization which is selected from the group consisting of polypropylene and copolymers of propylene with up to 20% by weight of ethylene, butene-1 or hexene-1 which polymer has a heptane-extractable portion of 5–60%, and I-value measured according to DIN 53 728 of 100–600 cm^3/g. and a yield point measured according to DIN 53 735 of 10–30 N/mm^2.

4,086,302

PHOSPHOROAMIDATES

Albert W. Morgan, Collinsville, Ill.; Ignatius Schumacher, and William Vanderlinde, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 599,569, Jul. 28, 1975, abandoned, which is a division of Ser. No. 459,257, Apr. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 276,810, Jul. 31, 1972, abandoned. This application Sep. 29, 1976, Ser. No. 727,913

Int. Cl.² C07F *9/24, 9/65*

U.S. Cl. 260—926 **2 Claims**

1. A compound of the formula

wherein

R represents an alkylene group of 1 to 50 carbon atoms or an arylene group;

R_3 and R_4 individually represent an alkyl group of 1 to 10 carbon atoms;

X represents oxygen or sulfur;

Z represents the residue of a hydroxyl-containing moiety which will react with a phosphorus oxyhalide or phosphorus thiohalide, said residue containing no free hydroxyl groups; and

n represents an integer of from 1 to 40.

4,086,303

COPOLYCONDENSATION PRODUCTS OF β-HALOALKYL PHOSPHATES AND DIALKYL PHOSPHONATES

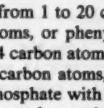
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 783,995, Apr. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 558,862, Mar. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 410,583, Nov. 12, 1973, abandoned. This application Jul. 5, 1977, Ser. No. 811,972

Int. Cl.² C07F *9/40;* C08J *9/00;* C08K *5/53*

U.S. Cl. 260—928 **25 Claims**

1. A copolycondensation product of a β-haloalkyl phosphate having from 2 to 4 carbon atoms in the alkyl moiety and a dialkyl phosphonate of the formula



in which R′ is alkyl of from 1 to 20 carbon atoms, alkenyl of from 3 to 20 carbon atoms, or phenyl optionally substituted with alkyl of from 1 to 4 carbon atoms and/or halogen, and R is alkyl of from 1 to 4 carbon atoms, said product being obtained by heating the phosphate with the dialkyl phosphonate until at least about one molar equivalent of alkyl halide is evolved.

4,086,304

ORGANIC TRIPHOSPHITES HAVING IMPROVED HYDROLYTIC STABILITY AND A PROCESS FOR STABILIZING ORGANIC TRIPHOSPHITES

Ronald Eric Hutton, Southport, and David Frederic Watson Cross, Liverpool, both of England, assignors to Akzona Incorporated, Asheville, N.C.

Filed Jun. 11, 1976, Ser. No. 695,112

Claims priority, application Netherlands, Jun. 12, 1975, 7506988

Int. Cl.² C07F *9/141, 9/15*

U.S. Cl. 260—989 **16 Claims**

1. A method of improving the hydrolytic stability of an organic triphosphite which comprises mixing the triphosphite with a stabilizing amount of a salt of a metal of Group I or II of the Periodic System and an organic acid having at least 8 carbon atoms.

4,086,305

HUMIDIFIER FOR RESPIRATORS HAVING A SEALED CONTAINER WATER SUPPLY TO A WATER STORAGE TANK

Günter Dobritz, Lubeck, Germany, assignor to Dragerwerk Aktiengesellschaft, Germany

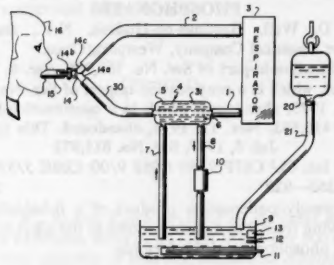
Filed Jun. 10, 1976, Ser. No. 694,605

Int. Cl.² B01F *3/04;* A61M *15/00*

U.S. Cl. 261—30 **1 Claim**

1. A humidifier for use with respirators, comprising a vessel having an inlet end connectable to an inhaling line and an outlet end spaced from said inlet end connectable to the user, means defining a passage between said inlet and said outlet having at least a portion with a wall defining an evaporation surface pervious to water vapor but impervious to water, means defining a water chamber in said vssel in contact with said evaporation surface, a water storage tank below said vessel, an inlet line and a return line for water depending from said vessel and extending downwardly from said water chamber into said water storage tank, means for circulating water from said storage tank to said water chamber through said inlet

line and into said water chamber and to said return line, a separate replaceable sealed water container located above said storage tank, for supplying water to said storage tank and a discharge conduit connected between said sealed water container and said water storage tank, an axially progressing screw rotatable in said passage and adjacent said evaporation surface and being rotatable by the flow of inhalation air between the convolutions thereof to direct the air outwardly into intimate contact with the surface.

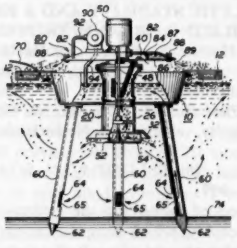


4,086,306

CENTRIFUGAL PUMP

Kaneyasu Yoshinaga, 166-1, Ohaza Nobe, Tatebayashi City, Gunma Prefecture, Japan

Filed Feb. 16, 1977, Ser. No. 769,105
Claims priority, application Japan, Apr. 9, 1976, 51-44432[U]
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—93 6 Claims



1. A centrifugal pump adapted to be used in a culture pond comprising;

a. a flat-bottomed cup-like vessel including a large opening formed through a central portion of the bottom wall thereof and a plurality of smaller holes through a peripheral portion of said bottom wall;

b. a pair of floaters diametrically positioned around an upper periphery of said vessel;

c. a leg means downwardly extending from each small hole in the bottom wall, said leg means having a water intake port at the lower end portion thereof, said leg means forming an intake pipe for carrying water from said pond to said vessel and said leg means securing said vessel to said pond;

d. an inner hollow cylinder closed at its top end and centrally and rigidly mounted through the large central opening of the bottom wall of said vessel and including an upper cylindrical portion having a suction chamber and a lower cylindrical portion separated by a radially extending depression formed around the peripheral wall of said inner hollow cylinder wherein said suction chamber is positioned within said vessel, said lower cylindrical portion extends downwardly below said bottom wall and said depression is seated in said large central opening; and

e. said inner hollow cylinder further including a plurality of uniformly spaced water intake slots formed around a peripheral wall of the suction chamber, a cover plate rigidly secured around the upper periphery of the upper cylindrical portion, said cover plate having a plurality of air-intake ports therethrough, an air suction pipe inserted into said suction chamber through one of the air-intake ports, the lower portion of said suction pipe being below the water level, a first hub axially provided within said cover plate and a second hub axially mounted on a plurality of radial spokes at the lower end portion of the lower cylindrical portion, an umbrella-shaped diffuser mounted around a lower periphery of the lower cylindrical portion, a drive shaft coupled to a motor shaft of an electric drive motor by a coupling passing through said first and second hubs, said drive shaft protruding beyond the lower cylindrical portion, and a centrifugal impeller rigidly secured to the lower end portion of said drive shaft such that a radial passageway is defined between the diffuser and the impeller.

4,086,307

TOWER PACKING SADDLE

Donald L. Glaspie, Dallas, Tex., assignor to Glitsch, Inc., Dallas, Tex.

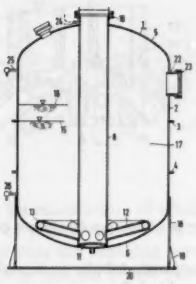
Continuation of Ser. No. 691,127, May 28, 1976, abandoned, which is a continuation of Ser. No. 485,408, Jul. 3, 1974, abandoned. This application Jul. 14, 1977, Ser. No. 815,739
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—97 6 Claims

1. An improved saddle packing element having a general shape that is a segment of an inner portion of a hollow torus having at each of its ends a generally arcuate end edge face, said faces lying in a cross-sectional plane including a cross-sectional axis, parallel and coplanar marginal edges at the periphery of arcuate marginal edge portions lying in generally parallel planes relative to a transverse plane including a transverse axis of said body, a plurality of generally cylindrical drip points, a portion of said drip points being positioned along said marginal edge portions to project beyond said marginal edges with the sides of said drip points projecting laterally beyond the surface of said marginal edge portions, the remaining portion of said marginal drip points projecting from said end edge faces in a direction away from said marginal edges, and wherein the body has a hole located therein with the center of said hole lying equidistant from said coplanar marginal edges and equidistant from said end edge faces, a transverse rib extending between said arcuate end edges substantially through said transverse plane and a central rib lying substantially in said central plane said ribs intersecting at said transverse axis to form a cross member across said hole.

4,086,308
PRESSURIZED RELIEF TANK FOR STEAM

Wolfgang Jürgens; Jörg Nageler, both of Erlangen, Germany; Josef Lippitsch, and Julius Holzner, both of Graz, Austria, assignors to Siemens Aktiengesellschaft and Waagner-Biro Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 550,280, Feb. 18, 1975, abandoned.
This application Jan. 14, 1977, Ser. No. 759,395
Int. Cl.[2] G21C *15/18*
U.S. Cl. 261—124 10 Claims



1. A relief tank in combination with a pressurized-water reactor cooling system for receiving and condensing steam from a steam space of a pressurizer of said pressurized-water reactor cooling system, said tank being closed and pressure-resistant and having means for providing water therein up to a level forming a space above the water, the tank having means for filling said space with gas and having a top and a substantially cylindrical side wall and a bottom, a steam pipe extending pressure-tightly downwardly with said side wall and having a bottom end portion close to said bottom of said tank, said pipe having a top outside of the tank connected pressure-tightly with said steam space, said bottom end portion of said pipe connecting with a plurality of imperforate pipes pressure-tightly radiating from said bottom end portion and having outer ends, and a tubular annulus being in connection with said outer ends, said imperforate pipes radiating outward in such a manner that said imperforate pipes and tubular annulus substantially match the inside contour of said tank's bottom, said tubular annulus having an upper portion and uniformly distributed holes being formed in said upper portion.

4,086,309
METHOD FOR SEALING CRACKS AND CAVITIES IN DIFFERENT KINDS OF BUILDING CONSTRUCTIONS, SUCH AS BUILDING CONSTRUCTIONS IN ROCK, CONCRETE, BRICKWORK AND TIMBER

Claes Yngve Hjalmar Alberts, Bromma, Sweden, assignor to Stabilator AB, Bromma, Sweden

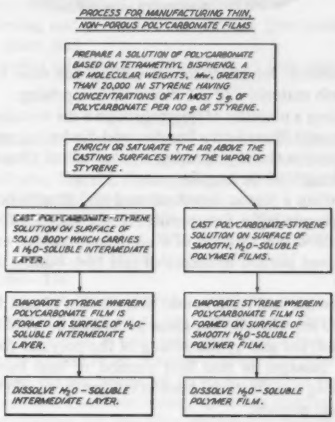
Filed Jun. 7, 1974, Ser. No. 477,264
Claims priority, application Sweden, Jun. 15, 1973, 7308458
Int. Cl.[2] E04B *1/16*
U.S. Cl. 264—35 1 Claim

1. A method for sealing water conveying cracks and cavities containing water therein in building constructions in rock, concrete, brickwork and timber which comprises drilling at least one hole into said building construction adjacent said water conveying crack or cavity and in communication therewith, sealing said hole in vacuum communication with a vacuum in source, maintaining a vacuum said hole for removing the water conveyed by said crack or cavity through said hole, applying a crack or cavity sealing material to said crack or cavity while maintaining said hole in communication with said vacuum source whereby said crack or cavity sealing material is drawn into crack or cavity and hardening said crack or cavity sealing material.

4,086,310
PROCESS FOR MANUFACTURING THIN, NON-POROUS GAS PERMEABLE POLYCARBONATE FILMS

Ludwig Bottenbruch; Günther Kämpf, both of Krefeld-Bockum; Volker Serini, and Hugo Vernaleken, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 402,430, Oct. 1, 1973, Pat. No. 3,975,225.
This application Mar. 15, 1976, Ser. No. 666,557
Claims priority, application Germany, Oct. 5, 1972, 2248818
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—41 4 Claims


PROCESS FOR MANUFACTURING THIN, NON-POROUS POLYCARBONATE FILMS.
PREPARE A SOLUTION OF POLYCARBONATE BASED ON TETRAMETHYL BISPHENOL A OF MOLECULAR WEIGHTS, M_w, GREATER THAN 20,000 IN STYRENE HAVING CONCENTRATIONS OF AT MOST 5 g. OF POLYCARBONATE PER 100 g. OF STYRENE.
ENRICH OR SATURATE THE AIR ABOVE THE CASTING SURFACES WITH THE VAPOR OF STYRENE.
CAST POLYCARBONATE-STYRENE SOLUTION ON SURFACE OF SOLID BODY WHICH CARRIES A H_2O-SOLUBLE INTERMEDIATE LAYER.
CAST POLYCARBONATE-STYRENE SOLUTION ON SURFACE OF SMOOTH, H_2O-SOLUBLE POLYMER FILMS.
EVAPORATE STYRENE WHEREIN POLYCARBONATE FILM IS FORMED ON SURFACE OF H_2O-SOLUBLE INTERMEDIATE LAYER.
EVAPORATE STYRENE WHEREIN POLYCARBONATE FILM IS FORMED ON SURFACE OF SMOOTH H_2O-SOLUBLE POLYMER FILM.
DISSOLVE H_2O - SOLUBLE INTERMEDIATE LAYER.
DISSOLVE H_2O - SOLUBLE POLYMER FILM.

1. A process for manufacturing non-porous, gas permeable films having thicknesses less than 1 μm of polycarbonates from 2,2-bis-(3,5-dimethyl-4-hydroxyphenyl)-propane having molecular weights, M_w, greater than 20,000 comprising spreading solutions of the polycarbonates in styrene, said solutions having concentrations of at most 5 g of polycarbonate per 100 g of styrene, on the surface of smooth, water-soluble polymer films; evaporating the styrene, wherein the polycarbonate film is formed on the surface of the smooth water-soluble polymer film; and thereafter dissolving the water-soluble polymer film.

4,086,311
METHODS FOR INCREASING THE CRUSHABILITY CHARACTERISTICS OF CORES FOR CASTING ADVANCED SUPERALLOY MATERIALS

Irvin C. Huseby, Schenectady, and Frederic J. Klug, Amsterdam, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1977, Ser. No. 775,760
Int. Cl.[2] C04B *35/64*
U.S. Cl. 264—43 10 Claims

1. A method for increasing the crushability characteristics of a ceramic article used as a core for casting metals including the process steps of:

(a) selecting a two-phase mixture which is one selected from the group consisting of $La_2O_3 \cdot 11Al_2O_3 + LaAlO_3$, $La_2O_3 \cdot 11Al_2O_3 + Al_2O_3$ and $MgAl_2O_4 + Al_2O_3$;

(b) forming an article to a predetermined configuration and a predetermined porosity content;

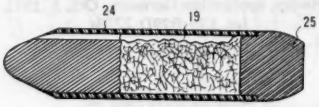
(c) subjecting the formed article to thermal shock to induce microcracks therein wherein the material therein exhibits a two-phase microstructure in which microcracks are initiated at a first interface of two different phases, extending across at least part of one of the phases toward a second interface.

4,086,312

WRITING PEN CORE HAVING AN INTEGRAL NIB AND INK RESERVOIR AND METHOD OF MANUFACTURE

Yoshio Midorikawa, Tokyo, Japan, assignor to Glasrock Products, Inc., Fairburn, Ga.

Filed Jul. 2, 1976, Ser. No. 702,067
Claims priority, application Japan, Apr. 8, 1976, 51-38709
Int. Cl.[2] D04H 1/64
U.S. Cl. 264—46.6 5 Claims



1. A method for producing a writing pen core having an integral nib material and ink reservoir comprising:

(a) passing a plurality of fibers through a die to compress and form said fibers into a bundle, said die having an internal protrusion thereby forming a longitudinal channel along the length of the bundle;

(b) forming a plastic sheath around said fiber bundle; then

(c) impregnating a first portion of the length of said fiber bundle with a solution of a urethane prepolymer, leaving a second portion or length of said fiber bundle untreated; and

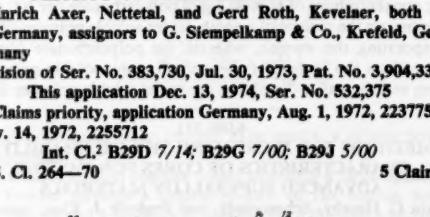
(d) allowing said resin in said first portion of said fiber bundle to set whereby the gases generated by volatization of the solvent and by the setting of the polymer form capillary passages in said first portion of said bundle, thus forming a nib material portion integral with said untreated second portion.

4,086,313

METHOD OF MAKING PRESSED BOARD

Heinrich Axer, Nettetal, and Gerd Roth, Kevelaer, both of Germany, assignors to G. Siempelkamp & Co., Krefeld, Germany

Division of Ser. No. 383,730, Jul. 30, 1973, Pat. No. 3,904,336. This application Dec. 13, 1974, Ser. No. 532,375
Claims priority, application Germany, Aug. 1, 1972, 2237755; Nov. 14, 1972, 2255712
Int. Cl.[2] B29D 7/14; B29G 7/00; B29J 5/00
U.S. Cl. 264—70 5 Claims



1. In a method of making pressed boards, the steps comprising:

continuously blowing a mixture of filler particles coated with thermosetting resin into a space between converging perforated conveyor belts and compacting said particles in said space;

orienting said particles upon their entry into said space by vibrating said belts adjacent an entrance to said space; and

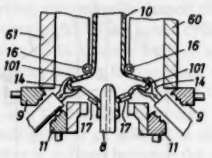
preheating a carrier gas, used for said blowing, sufficiently to partially cure said resin.

4,086,314

METHOD OF AND APPARATUS FOR THE PRODUCTION OF THERMOPLASTIC CONTAINERS

Dieter Lampart, Ettlingen, and Kalman Körmendi, Karlsruhe, both of Germany, assignors to Elbatainer Kunststoff- und Verpackungs-Gesellschaft mbH, Ettlingen, Baden, Germany

Filed Mar. 30, 1977, Ser. No. 782,850
Claims priority, application Germany, Mar. 31, 1976, 2613689
Int. Cl.[2] B29C 17/07
U.S. Cl. 264—89 9 Claims



1. A process for producing a container comprising the steps of:

feeding a thermoplastic tubular parison downwardly into an open blow mold defining in a closed position a mold cavity having a shape of a container to be produced;

introducing a blowing mandrel into the lower end of said parison and spreading said lower end to form an elongated balloon-shaped bulge therein;

pressing upper and lower portions of said bulge together while continuing to feed said parison downwardly on at least one side of said parison to produce a lateral protuberance on said side;

gripping said protuberance and drawing same downwardly and outwardly between a pair of grip-shaping dies adapted to form a grip and opening around said grip in the wall of the parison;

closing said die on said protuberance;

closing said blow mold; and

introducing air through said mandrel to expand the parison in said cavity to the configuration thereof, thereby forming said container unitarily with a handgrip.

2. An apparatus for producing a container comprising:

a pair of mold halves closeable to define a mold cavity having the configuration of a container to be produced and separatable to form a gap between them, said mold cavity receiving a parison from above;

means above said mold halves for feeding said parison downwardly;

a blowing and spreading mandrel extending upwardly between said mold halves for engagement with the lower portion of said parison, whereby further advance of material of said parison toward said mandrel producing a bulge in the lower portion thereof;

a pair of rods and means displacing said rods to insert them into said gap above said lower portion with said rods flanking said parison, and displacing said rods downwardly to press upper portions of said bulge downwardly;

a pair of flat support members disposed below said rods for supporting said bulge on opposite sides of said parison, whereby said rods press said upper portions of said bulge toward said support members and produce lateral protuberances of said parison;

respective grippers operable to engage said protuberances;

means displacing said grippers downwardly and outwardly to draw said protuberances and outwardly;

respective pairs of grip-shaping die elements at the bottom of said cavity; and

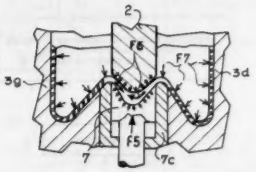
means displacing said elements into engagement with the outwardly and downwardly drawn protuberances for shaping the same into respective grips and grip openings.

4,086,315

PRODUCTION OF HOLLOW PLASTIC BODIES

Tadeusz Piotrowski, 21 rue Ampere, Lagny, Seine et Marne, France, assignor to Tadeusz Piotrowski and Societe Nouvelle du Plastique, both of, France

Filed Aug. 26, 1976, Ser. No. 718,083
Claims priority, application France, Aug. 27, 1975, 75 26375
Int. Cl.² B29C 17/07
U.S. Cl. 264—97 5 Claims



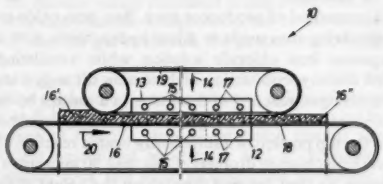
1. A process for the manufacture of a hollow plastic body, wherein a parison of plastic material is formed in a parison mold having a blow core and centering means for positioning the head of the core at one end of said parison mold and the parison is subsequently shaped into the hollow body within a blow mold having an axially displaceable bottom portion, which comprises positioning the blow core within said parison mold so that said core and said parison mold define a parison-forming cavity, with said centering means having at least one spacer element that extends through said cavity at said one end of said mold; injecting hot plastic material under pressure into the parison forming cavity and around said at least one spacer means whereby at least one hole extends through the parison of plastic material; removing the parison on said core from said parison mold; transferring the core and said parison into said blow mold; positioning the core closely adjacent to the bottom portion of said blow mold, with said at least one hole in the parison being located between said core and said bottom portion; effecting axial displacement of said bottom portion of said blow mold towards said core to close said at least one hole by extrusion of said plastic material; blowing the parison mold into said hollow body within said blow mold and then unmolding the hollow body from said blow mold.

4,086,316

PROCESS FOR THE MANUFACTURE OF FLAT SHEETS OR WEBS

Klaus Ahrweiler, Willich; Ferdinand Leifeld, Kempen; Kurt Quoos, Krefeld, and Eduard Finkenweg 18 Kusters, 415 Krefeld-Forstwald, all of Germany, assignors to Eduard Kusters, Krefeld, Germany

Continuation of Ser. No. 450,347, Mar. 12, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,080
Int. Cl.² B29J 1/02
U.S. Cl. 264—120 4 Claims



1. A process for manufacturing, from natural fibrous cellulose material which has been comminuted into individual fibers, a flat sheet selected from the group consisting of paper and cardboard, comprising:

(a) placing a substantially dry mass of this comminuted cellulose material upon a support;
(b) moistening said mass with an amount of water less than the moisture absorptive capacity of said mass;
(c) hot pressing said mass at a temperature above 100° C and at a pressure of 10–50 kg/cm/sq for a period of at least 1 second to form said mass into a flat sheet and cause said individual fibers to hydrogen bond;
(d) cooling said formed sheet while maintaining pressure thereon equal to or less than that in step (c), but sufficient to prevent the sudden release of steam formed in said mass during step (c), whereby said cooling condenses formed steam to release said formed sheet of steam pressure and thereby avoid ripping or splitting of said sheet upon subsequent release of said pressure;
(e) relieving said pressure from said flat fiber bonded cellulose sheet, and
(f) removing said bonded cellulose sheet from said support.

4,086,317

PROCESS FOR PRODUCTION OF A SYNTHETIC PAPER IMPROVED AGAINST DUSTING TROUBLE

Yoshio Miyabe, Ibaraki, Japan, assignor to Oji Yuka Goseishi Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 459,202, Apr. 8, 1974, abandoned. This application Jan. 6, 1976, Ser. No. 646,939
Int. Cl.² B32B 31/12; B29D 7/24
U.S. Cl. 264—134 10 Claims

1. In a process for producing a synthetic paper having an opaque paperlike layer on at least one surface thereof which comprises stretching in one axial direction a laminate sheet containing a surface layer of a resin having fine filler particles incorporated therein laminated on to at least one surface of a resinous substrate, said stretching operation causing the resin surface containing the fine filler particles to become opaque, the improvement which comprises (a) coating the surface of the layer containing filler particles therein with an aqueous dispersion of a dry-extensible, polymeric coating material to avoid dusting problems due to the filler particles coming off the surface of the resin layer, said coating material being selected from the group consisting of C_1–C_4 alkyl acrylate homopolymers or copolymers, ethylene vinyl acetate copolymers and polyethylene wax, the concentration of said coating material being in the range of 3 to 10% by weight of the aqueous dispersion and the amount of said dispersion applied being in the range of 0.3 to 1 g/m² on the basis of the coating material; (b) drying the coated sheet, and (c) subjecting the coated sheet to a transverse stretching operation, said steps (a) and (b) being carried out at the latest before the transverse stretching operation (c).

4,086,318

MOLDING PROCESS FOR A PLASTIC-COATED CERAMIC DECORATIVE PLUMBING FIXTURE

Louis A. Garasi, Canyon Country, and Ronald F. Hayes, Northridge, both of Calif., assignors to Gruber Systems, Inc., Valencia, Calif.

Filed Apr. 18, 1977, Ser. No. 788,547
Int. Cl.² B29C 5/00, 25/00; B29G 7/00
U.S. Cl. 264—135 2 Claims

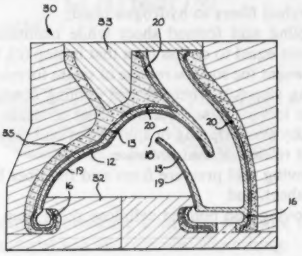
1. A molding process adapted for the production of a plumbing fixture whose functional surfaces are resistant to erosion caused by moving water wherein a ceramic shell forms a liner having external surfaces and the functional surfaces of said plumbing fixture, said molding process comprising the steps of:

a. coating the external surfaces of said ceramic shell with a layer of resilient material;
b. suspending said ceramic shell upside down within a female mold member having internal surfaces so that the internal surfaces of said female mold member are slightly spaced from the external surfaces of said ceramic shell thereby leaving a gap between the internal surfaces of said female

mold member and the external surfaces of said ceramic shell;

c. filling said gap with a catalyzed polyester resin matrix mixed with a filler and pigments;

d. permitting said matrix to bond and to cure to the coated external surfaces of said ceramic shell; and



e. removing said female mold member thereby producing a plumbing fixture having an attractive exterior appearance which matches the color texture and the design of other plumbing fixtures to be used in the same room.

4,086,319

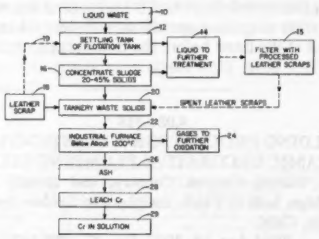
RECOVERY OF CHROMIUM FROM TANNERY WASTE

Bradford H. Jones, 85 Portsmouth Ave., Stratham, N.H. 03885

Continuation-in-part of Ser. No. 694,244, Jun. 9, 1976, abandoned. This application Nov. 8, 1976, Ser. No. 740,016

Int. Cl.[2] C01G *37/02, 37/14*

U.S. Cl. 423—53 **19 Claims**



1. The method of processing tannery waste solids containing trivalent chromium and organic material and recovering chromium therefrom, said method comprising:

(a) burning at least one ton per day of said waste in the combustion zone of an industrial furnace at a temperature below about 1200° F. in the presence of sufficient alkali to oxidize the majority of said chromium to hexavalent chromium in the furnace ash and to convert at least a portion of said organic material to gases;

(b) removing said gases from the combustion zone and subjecting them to further oxidation; and,

(c) removing said ash from the furnace and recovering said hexavalent chromium therefrom.

4,086,320

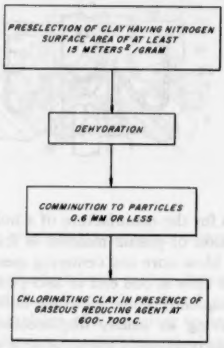
PRODUCTION OF ALUMINUM CHLORIDE FROM RAW MATERIALS CONTAINING ALUMINUM COMPOUNDS AND SILICON COMPOUNDS

Edward S. Martin, and David A. Wohleber, both of Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 23, 1977, Ser. No. 780,535

Int. Cl.[2] C01F *7/56, 7/58*

U.S. Cl. 423—135 **7 Claims**


PRESELECTION OF CLAY HAVING NITROGEN SURFACE AREA OF AT LEAST 15 METERS² / GRAM
DEHYDRATION
COMMINUTION TO PARTICLES 0.6 MM OR LESS
CHLORINATING CLAY IN PRESENCE OF GASEOUS REDUCING AGENT AT 600-700°C.

1. An improved process for the selective production of aluminum chloride by the chlorination of a source material containing both aluminum compounds and silicon compounds while inhibiting production of silicon chloride which comprises:

a. selecting a source material which has a surface area of at least 15 meters[2] per gram;

b. comminuting the source material to a particle size of 90% by weight not greater than 0.6 millimeters;

c. dehydrating the comminuted source material by roasting it at a temperature of 600° to 900° C for a period of 10 minutes to 4 hours;

d. chlorinating the comminuted source material with a chlorinating agent in the presence of a gaseous reducing agent at a temperature of at least 600° C but less than 700° C; and

e. separating aluminum chloride from said chlorinated source material.

4,086,321

PRODUCING PURE IRON OXIDES

Carl A. Holley, 2500 Baldwick Rd., Pittsburgh, Pa. 15205, and Russell J. McKinnon, Pittsburgh, Pa., assignors to Carl A. Holley, Pittsburgh, Pa.

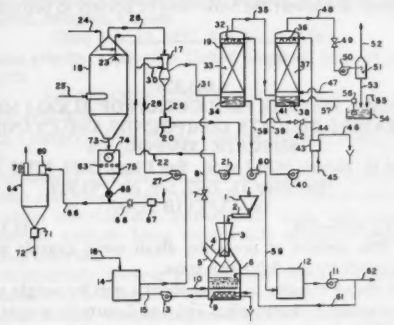
Filed Jun. 21, 1976, Ser. No. 697,958

Int. Cl.[2] C01G *49/02*

U.S. Cl. 423—150 **25 Claims**

1. The method of producing pure, fine, iron oxide comprising, dissolving iron oxide in dilute hydrochloric acid to form an aqueous iron chloride solution while ventilating gases formed thereby, conducting said solution through a scrubber-heat exchanger, reacting said solution in a reactor by spraying the concentrated solution together with oxygen, at about 2500° F into the top portion of a sufficiently heated reaction chamber to form iron chloride droplets of less than 50 microns in diameter which, as they descend throughout the height of the reaction chamber, will decompose in the presence of the oxygen and water vapor to form iron oxide particles of the order of .7 micron size, which collect at the bottom of said reactor, and hydrogen chloride vapor together with remnant iron oxide and water vapor which are conducted to said scrubber-heat ex-

changer where the sensible heat of the gases is given up to the incoming iron chloride solution and the remnant iron oxide

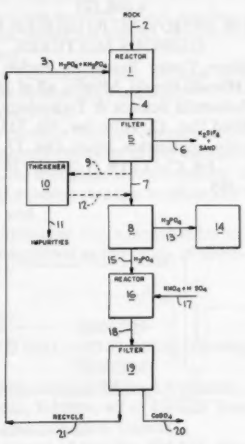


redissolved, and reintroducing said redissolved iron oxide into said reactor along with the new iron chloride solution.

4,086,322
PRODUCTION OF FLUORIDE-FREE PHOSPHATES

Erhart K. Drechsel, Houston, Tex., assignor to Pennzoil Company, Shreveport, La.

Continuation-in-part of Ser. No. 512,877, Oct. 7, 1974, abandoned. This application Aug. 29, 1975, Ser. No. 608,973
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—158 **12 Claims**



1. A method for the treatment of phosphate rock to recover phosphoric acid essentially free of fluoride contamination and recover the fluorine values contained in said phosphate rock in useful form, said reaction being conducted in the substantial absence of fluoride gas evolution, the process comprising the steps of:

(a) reacting a fluoride-containing phosphate rock with a solution of phosphoric acid containing values of potassium ions as K_2O values, the K_2O values being provided by the presence of KH_2PO_4, in an acidulation reactor using a sufficient amount of phosphoric acid to acidulate said phosphate rock and form monocalcium phosphate at a temperature of about 90° to 100° C.; the amount of phosphoric acid used being sufficient to provide a molar ratio of P_2O_5 in the phosphoric acid to P_2O_5 in the rock in the range of about 6:1 to 15:1 respectively; and said phosphoric acid containing a sufficient amount of said KH_2PO_4 to react with fluorides liberated during said acidulation and convert said fluorides to solid potassium fluosilicates;

(b) solubilizing the monocalcium phosphate resulting from the reaction into the phosphoric acid solution;

(c) separating the insolubles contained in the hot solution of monocalcium phosphate in phosphoric acid at about the reaction temperature;

(d) cooling the resulting solution by a temperature difference of about 40° to 50° C. below said reaction temperature to precipitate a relatively pure potassium fluosilicate;

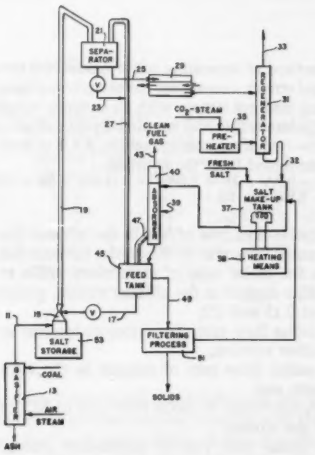
(e) separating and recovering the solid potassium fluosilicate precipitate; and

(f) recovering a solution of monocalcium phosphate in phosphoric acid substantially free from fluoride impurities.

4,086,323
PROCESS FOR REMOVAL OF SULFUR COMPOUNDS FROM FUEL GASES

Raymond H. Moore, and Gary E. Stegen, both of Richland, Wash., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 21, 1977, Ser. No. 808,488
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—210.5 **10 Claims**



1. In a continuous process for extracting hydrogen sulfide from a fuel-gas stream wherein the gas stream is contacted with a flow of molten, metal-carbonate salt mixture to form metal sulfide and the salt mixture is subsequently regenerated to lower its metal sulfide concentration by contact with carbon dioxide and steam, the improvement following said fuel-gas and molten salt contact comprising:

separating said salt mixture from said fuel-gas stream and dividing said salt mixture into a major flow portion and a minor flow portion, each flow portion having a first concentration of metal sulfide;

regenerating said minor flow portion of salt by contacting it with a gas flow of steam and carbon dioxide to enrich the gas flow in hydrogen sulfide and to deplete the minor flow portion of molten salt to a second concentration that is less than said first concentration of metal sulfide;

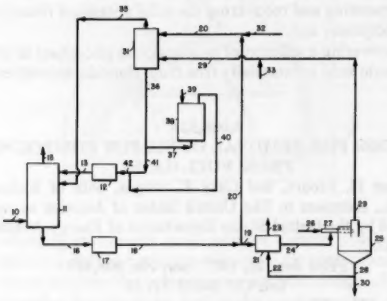
contacting said fuel-gas stream with said minor flow portion of molten salt at said second concentration of metal sulfide to further absorb hydrogen sulfide from said fuel gas stream; and

recombining said minor flow portion with said major flow portion of molten salt for contacting said fuel-gas stream with the combined flow of molten salt.

4,086,324
REMOVAL OF SULFUR AND NITROGEN OXIDES WITH AQUEOUS ABSORBENT

Albert B. Welty, Jr., 225 Watchung Fork, Westfield, N.J. 07090

Continuation-in-part of Ser. No. 291,385, Sep. 22, 1972, abandoned. This application Jan. 11, 1974, Ser. No. 432,434
Int. Cl.[2] C01B *21/00, 17/00*
U.S. Cl. 423—235 4 Claims



1. A method of separating sulfur oxides and nitrogen oxides from a gas stream containing the same comprising the step of contacting said gas stream with an aqueous solution comprising ammonium sulfite and ammonium thiosulfate such that the molar flow rate of ammonium sulfite, AS is at least equal to the value determined from the equation:

$$AS = 0.9A + 2B + 0.006Z + c\,(1.8A + 2B + 2.0y + 0.024Z + D)$$

where

A = molar flow rate of SO_2 in the influent flue gas stream;
B = molar flow rate of SO_3 in the influent flue gas stream;
c = is the molar ratio of ammonium sulfite to ammonium bisulfite desired in the effluent stream, generally between about 0.15 and 1.0;
D = molar flow rate of ammonium bisulfite in the influent scrubber solution;
Z = molar flow rate of oxygen in the influent flue gas stream; and
y = O_2 equivalent to molar flow rate of NO_x in the influent flue gas stream;

and the molar flow rate of ammonium thiosulfate, NT, is within the range determined with the following equation:

$$NT = X\,(1.0y + 0.012Z)$$

where

X is a number between 1.1 and 2.0; and
y and Z are as previously defined,

said contacting being accomplished at conditions such that sulfur dioxide reacts with ammonium sulfite to form ammonium bisulfite and nitrogen oxides react with ammonium thiosulfate.

4,086,325
PROCESS FOR DRYING SOLUTIONS CONTAINING BORIC ACID

Jean-Pierre Cordier, Braine-le-Comte, and Marc Vandorpe, Retie, both of Belgium, assignors to Belgonucleaire, S.A., Brussels, Belgium

Filed Feb. 14, 1977, Ser. No. 768,273
Claims priority, application Belgium, Feb. 13, 1976, 17207
Int. Cl.[2] C01B *15/12*
U.S. Cl. 423—280 4 Claims

1. A process for drying concentrates containing boric acid and/or borates by evaporation of these concentrates after addition of lime characterized in that the amount of lime is insufficient to convert all of the boric acid or borates to calcium borate and that an oxidizing agent is added to the concentrates wherein the oxidizing agent is employed in an amount sufficient to convert the boric acid or borates to perborate.

4,086,326
PROCESS FOR THE PRODUCTION OF ALKALI METAL CYANIDE SILICATE COMPOUNDS AND CYANIDE SILICATE COMPOUNDS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Filed May 31, 1977, Ser. No. 801,819
Int. Cl.[2] C01B *33/00*
U.S. Cl. 423—332 11 Claims

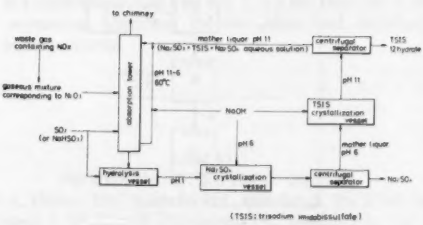
1. The method of preparing alkali metal cyanide silicate compounds by the following steps:

(a) mixing together in water about 1 part by weight of fine granular hydrated silica and 1 to 2 parts by weight of an alkali metal cyanide compound selected from the group consisting of sodium cyanide, potassium cyanide, lithium cyanide, cesium cyanide and mixtures thereof:
(b) evaporating the water, then heating the resulting mixture containing the alkali metal cyanide to 150° to 200° C while agitating for 5 to 30 minutes, thereby
(c) producing a brown granular mixture of alkali metal cyanide silicate ($RSiO_2CN$) and dialkali metal dicyanide silicate [$R_2SiO_2(CN)_2$], wherein R is sodium, potassium, lithium, cesium, and mixtures thereof.

4,086,327
PROCESS FOR REMOVING NITROGEN OXIDES FROM GASEOUS MIXTURES

Yukio Ito, Tokyo; Yosiro Yasumoto, Fuchu; Etsuro Masuda, Tokyo, and Hiroshi Suzuki, Mitaka, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,739
Claims priority, application Japan, Oct. 17, 1975, 50-124433
Int. Cl.[2] C01B *21/00, 21/10*
U.S. Cl. 423—385 6 Claims



(TSIS: trisodium imidobissulfate)

1. A process for removing nitrogen oxides from gaseous mixtures and which comprises the steps of (1) contacting gaseous mixtures containing nitrogen oxides with an aqueous absorption solution containing sodium sulfite, trisodium imidobissulfate and sodium sulfate while adjusting the pH of the solution to 6 – 11 with sodium hydroxide or sodium carbonate such that nitrogen oxides are absorbed; (2) simultaneously with or subsequent to (1), contacting said aqueous solution with sulfur dioxide or sodium hydrogensulfite to produce disodium imidobissulfate and sodium hydrogensulfate; (3) adding sodium hydroxide to the reaction solution formed in (2) to precipitate sodium sulfate 10 hydrate, firstly, and trisodium imidobissulfate 12 hydrate, secondly; (4) separating the sodium sulfate 10 hydrate and trisodium imidobissulfate 12 hydrate from the mixture formed in (3) to produce a mother liquor; and (5) recycling the mother liquor for use as the absorption solution for nitrogen oxides.

4,086,328

PRODUCTION OF CHLORINE DIOXIDE FROM BUFFERED REACTION MEDIA

Richard Swindells, Caledon, Canada, assignor to Erco Industries Limited, Islington, Canada

Filed Feb. 22, 1977, Ser. No. 770,361

Claims priority, application United Kingdom, Mar. 19, 1976, 11124/76

Int. Cl.[2] C01B *11/02, 7/04;* C01D *3/04*

U.S. Cl. 423—478 4 Claims

1. In a method of producing chlorine dioxide, which comprises:

a. establishing in a reaction zone an aqueous reaction medium containing dissolved quantities of sodium chlorate, sodium chloride and hydrochloric acid, said aqueous reaction medium being substantially saturated with sodium chloride,

b. continuously feeding hydrochloric acid or hydrogen chloride to said aqueous reaction medium,

c. continuously maintaining said reaction medium at its boiling point at the absolute pressure thereon at a temperature below that above which substantial decomposition of chlorine dioxide occurs,

d. continuously maintaining said reaction zone under a subatmospheric pressure sufficient to maintain said reaction medium at its boiling point,

e. continuously generating chlorine dioxide, chlorine and sodium chloride in said reaction medium,

f. continuously removing from said reaction zone a gaseous mixture of chlorine dioxide, chlorine and steam wherein the volume ratio of steam to chlorine dioxide is greater than that below which substantial decomposition of chlorine dioxide occurs,

g. continuously depositing said generated sodium chloride from said reaction medium in said reaction zone,

h. removing said deposited sodium chloride from said reaction zone, and

i. continuously maintaining the volume of liquid in said reaction zone substantially constant,

the improvement wherein

j. said aqueous reaction medium contains at least one buffering anion selected from the group consisting of divalent and multivalent inorganic anionic species which is introduced to said aqueous reaction medium as a water-soluble salt thereof, and

k. the actual hydrogen ion concentration in said reaction medium is maintained in the range of about 0.05 to about 0.03 normal.

4,086,329

INTEGRATED CHLORINE DIOXIDE PRODUCING SYSTEM

Gerald Cowley, Mississauga; Richard Swindells, Caledon, and Mark Kostanecki, Toronto, all of Canada, assignors to Erco Industries Limited, Islington, Canada

Continuation-in-part of Ser. No. 634,137, Nov. 21, 1975, abandoned. This application Apr. 14, 1977, Ser. No. 787,320

Claims priority, application United Kingdom, Dec. 13, 1974, 53899/74

Int. Cl.[2] C01B *11/02, 7/04;* C01D *5/00*

U.S. Cl. 423—478 11 Claims

1. A method for the steady state continuous production of chlorine dioxide from an acid aqueous reaction medium by reduction of chlorate ions with chloride ions, which comprises:

(a) establishing an aqueous acid reaction medium containing hydrogen ions, chlorate ions, chloride ions, sodium ions and sulphate ions in a reaction zone capable of forming chloride dioxide and chlorine and having a total acid normality of between about 2 and about 4.8 normal,

(b) maintaining said reaction zone under a subatmospheric pressure, maintaining said reaction medium at its boiling point at an elevated temperature below that above which substantial decomposition of chlorine dioxide occurs,

(c) continuously generating chloride dioxide and chlorine from said aqueous reaction medium in accordance with the equations:

$$ClO_3^- + Cl^- + 2H^+ \rightarrow ClO_2 + \tfrac{1}{2}Cl_2 + H_2O \quad (1)$$

$$ClO_3^- + 5Cl^- + 6H^+ \rightarrow 3Cl_2 + 3H_2O \quad (2)$$

the proportion of chlorate ions converted to chlorine dioxide in accordance with equation (1) being designated the efficiency (E) of the chlorine dioxide and chlorine generating reaction, said efficiency being less than 1.00,

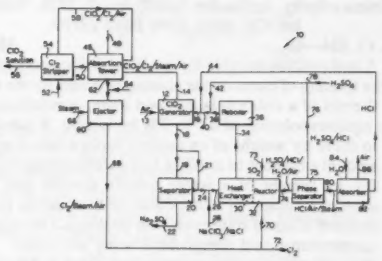
(d) continuously feeding to said reaction medium hydrogen ions in a quantity of $(6-4E/E)$ moles per mole of chlorine dioxide formed and chlorine ions in a quantity of $(5-4E/E)$ moles per mole of chlorine dioxide formed,

(e) continuously feeding to said reaction medium sodium chlorate in a quantity of $(1/E)$ moles per mole of chlorine dioxide formed in sulphate ions in a quantity of $(1/2E)$ moles per mole of chlorine dioxide formed,

(f) continuously evaporating water from said reaction medium to form in said reaction zone with said generated chlorine dioxide and chlorine in gaseous mixture of chlorine dioxide, chlorine and water vapour,

(g) continuously depositing from said aqueous reaction medium $(1/2E)$ moles of anhydrous neutral sodium sulphate per mole of chlorine dioxide formed,

(h) continuously removing said gaseous mixture from said



reaction zone, continuously condensing the water vapour of said removed gaseous mixture, continuously forming an aqueous solution of substantially all the chlorine dioxide content of said gaseous mixture and additionally optionally containing a minor proportion of the chlorine content of said gaseous mixture,

(i) continuously recovering said aqueous solution of chlorine dioxide,

(j) reacting sulphur dioxide and water with chlorine including at least part of substantially all the remainder in said gaseous mixture not dissolved in said aqueous chlorine dioxide solution to form hydrochloric acid and sulphuric acid in just sufficient quantity to provide $(1/2E)$ moles of sulphate ion in said sulphuric acid,

(k) continuously forwarding said hydrochloric acid and sulphuric acid formed in the latter reaction to said reaction medium to provide part only of both said fed hydrogen ions and chloride ions and all of said fed sulphate ions,

(l) continuously supplementing the hydrogen ion and chloride ion quantities of said forwarded stream to provide said feed of hydrogen ions of $(6-4E/E)$ moles per mole of chlorine dioxide formed and said feed of chloride ions of $(5-4E/E)$ moles per mole of chlorine dioxide formed, and

(m) removing said deposited anhydrous neutral sodium sulphate from said reaction zone.

4,086,330

LABELLED PHOSPHOLIPID SPHERES FOR ORGAN VISUALIZATION

Abram Petkau, Pinawa, and Stanley Daniel Pleskach, Beausejour, both of Canada, assignors to The Atomic Energy of Canada Limited, Ottawa, Canada

Division of Ser. No. 539,134, Jan. 7, 1975, Pat. No. 3,992,513. This application May 12, 1976, Ser. No. 685,587
Int. Cl.[2] A61K *29/00, 43/00*
U.S. Cl. 424—1 8 Claims

1. A kit for the preparation of medical scanning agents labelled with short-lived radioisotope ^{99m}Tc for use in conjunction with a source of radioisotope yielding pertechnetate anion which comprises as components:

1. an aqueous colloidal dispersion of phospholipid material having a predetermined particle size so as to localize at preselected organs after injection;
2. a concentrated reducing agent for obtaining ^{99m}Tc in multivalent cationic form from $^{99m}TcO_4^-$; and
3. a buffering agent; and means to keep said components separate from one another until use.

4,086,331

GELATIN-BASED COMPOSITIONS AND A METHOD FOR THE GENERATION OF STABILIZED FOAMS THEREFROM

Peter Neumann, Haifa, Israel, assignor to Technion Research and Development Foundation Ltd., Haifa, Israel

Filed Jun. 17, 1976, Ser. No. 697,258
Claims priority, application Israel, Jan. 7, 1975, 74615
Int. Cl.[2] A61L *9/04;* B01J *13/00*
U.S. Cl. 424—45 15 Claims

1. A composition suitable for use in medicine and agriculture for the treating of burns or the coating of plants by the application thereto of a stable gelatin-based foam, comprising

an aqueous solution of 0.1 to 3% by weight of gelatin; 0.01 to 0.2% by weight of an anionic surface active agent; an amount sufficient to stabilize said gelatin-based foam up to 1% by weight of a water soluble ferrous salt; and an amount sufficient of glutaraldehyde to maintain said composition in liquid state even after prolonged storage at low temperatures; said composition being non-toxic.

8. A composition in accordance with claim 1, wherein said glutaraldehyde is present in an amount of 0.01 to 0.4% by weight.

9. A medicinal composition in accordance with claim 8, wherein said composition further contains an amount sufficient, to enhance evaporation of the water from said aqueous solution, of a water-miscible organic solvent selected from the group consisting of methanol, ethanol, n-propanol and isopropanol; and a bacterialcidal-effective amount of a bacteriacide.

10. An aerosol package for a generating gelatin-based foam for medical application comprising an aerosol container formulated with a suitable propellant and containing the composition of claim 9.

4,086,332

DOXYCYCLINE COMPOSITIONS

William W. Armstrong, Mill Neck, N.Y., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 646,295, Jan. 2, 1976, Pat. No. 4,018,889. This application Dec. 7, 1976, Ser. No. 748,600
The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.
Int. Cl.[2] A61K *31/79, 31/65*
U.S. Cl. 424—80 8 Claims

1. A doxycycline composition comprising an aqueous solution of from about 1 to 25% by weight of an antibiotic compound selected from the group consisting of doxycycline and the pharmaceutically acceptable acid addition salts thereof, from about 1.8 to 2.2 molar proportions based on said antibiotic of a pharmaceutically acceptable magnesium compound soluble in said solution, and from about 10 to 70% by weight of 2-pyrrolidone, said composition having a pH value in the range of from about 3 to 7.5.

4,086,333

METHOD OF ELIMINATING SEXUAL EXCITANTS FROM THE DISCHARGE OF A FEMALE ANIMAL IN ESTRUS

Claudia Bredwell, 15 W. 72nd St., New York, N.Y. 10023

Continuation-in-part of Ser. No. 646,442, Jan. 5, 1976, abandoned. This application Jan. 27, 1976, Ser. No. 652,931
Int. Cl.[2] A61K *9/02, 31/20, 31/22, 33/40*
U.S. Cl. 424—130 14 Claims

1. A method of eliminating sexual excitants emitted by a female animal in estrus, comprising the step of topically treating with an effective amount of a compound incorporating stabilized chlorine dioxide that region of said animal where said excitant is present, said compound being selected from the group consisting of those formed by the reaction of chlorine dioxide with sodium carbonate peroxide and chlorine dioxide with sodium perborate.

4,086,334

COMPOSITION AND METHOD FOR THE TREATMENT OF DISORDERS OF CALCIUM METABOLISM

Manfred Schmidt-Dunker, Düsseldorf, and Matthias Potokar, Heiligenhaus, both of Germany, assignors to Henkel Kommanditgesellschaft Auf Aktien, Düsseldorf-Holthausen, Germany

Filed Nov. 29, 1976, Ser. No. 745,838
Claims priority, application Germany, Dec. 1, 1975, 2553963; Dec. 1, 1975, 2553962; Dec. 1, 1975, 2553964
Int. Cl.[2] A61K *37/00;* C07C *103/52*
U.S. Cl. 424—177 28 Claims

1. A composition for inhibiting pathological solubilization of bone calcium in mammals, comprising (A) a water-soluble calcitonin and (B) a water-soluble pharmaceutically acceptable organic adjuvant compound effective against Paget's disease, said compound containing at least two acidic groups separated by not more than two carbon atoms, and being selected from the group consisting of cyclohexanehexacarboxylic acid, azacycloheptane-2,2-diphosphonic acid,2,7-dioxo-2-hydroxy-3-amino-3-phosphono-1,2-azaphosphacycloheptane, 3-amino-1-hydroxypropane-1,1-diphosphonic acid, phosphono-1,2-ethanedicarboxylic acid, 2-phosphono-2,3-propanedicarboxylic acid, 2-phosphonobutane-1,2,4-tricarboxylic acid, and the water-soluble salts thereof, the ratio of (A) to (B) being between 1:10 and 10:1, if the amount of (A) is expressed in MRC units and the amount of (B) in mg.

4,086,335

PHARMACEUTICAL TABLETS CONTAINING CHITIN AS A DISINTEGRANT

Frank N. Bruscato, 2209 Fannie St., and August G. Danti, 2211 Ann St., both of Monroe, La. 71201

Filed Oct. 29, 1975, Ser. No. 626,988
Int. Cl.[2] A61K *31/70, 47/00*
U.S. Cl. 424—180 2 Claims

1. A method of causing a pharmaceutical tablet to disintegrate upon being administered to an animal, which comprises administering to the animal a tablet fabricated from a mixture containing a pharmaceutically-active ingredient and a disintegratingly-effective amount of chitin.

4,086,336
PHOSPHONOTHIOUREIDE ANTHELMINTICS

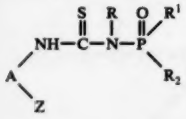
Ronald P. Owen, Warminster; George A. Miller, Glenside, both of Pa., and Charles M. Schneider, Cullowhee, N.C., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 354,630, Apr. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,423, May 26, 1972, abandoned. This application Aug. 24, 1976, Ser. No. 717,411

Int. Cl.[2] C07F 9/22; A01N 9/36

U.S. Cl. 424—204 38 Claims

1. A compound of the formula:

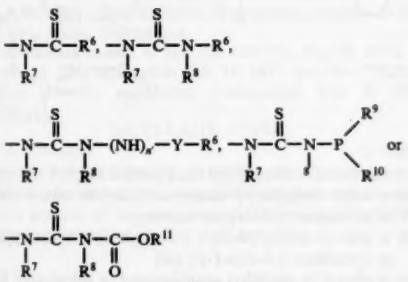


wherein A is a divalent arylene group optionally substituted with halo, cyano, thiocyano, carboxy, nitro, dialkylamino, vicinal alkylene, or a radical of the formula:

$R^3(X)_n$

wherein R^3 is an aliphatic group of from 1 to 18 carbon atoms, optionally substituted aryl, X is oxo, thio, sulfinyl, sulfonyl, or carbonyl and n is an integer of 0 to 1 with the proviso that when X is oxo and *n* is 1, R^3 is methyl; R is hydrogen, (C_1–C_{10}) alkyl, (C_1–C_{10}) haloalkyl, (C_3–C_6) cycloalkyl, (C_2–C_{11}) alkoxyalkyl, (C_1–C_{10}) cyanoalkyl, (C_3–C_6) alkenyl, (C_3–C_6) haloalkenyl, (C_3–C_6) alkynyl, (C_3–C_6) haloalkynyl, optionally substituted aralkyl of from 7 to 11 carbon atoms or optionally substituted (C_6–C_{10}) aryl; R^1 is R′, OR′, N(R′)$_2$ or SR′ R^2 is OR′, N(R′)$_2$ or SR′ wherein R′ is an aliphatic group of from 1 to 18 carbon atoms or optionally substituted aryl; Z is a group of the formula:

wherein R^4 and R^5 are hydrogen atoms or aliphatic groups of from 1 to 18 carbon atoms, Z is also —N=CHR^6;



wherein R^6 is an aliphatic group of from 1 to 18 carbon atoms, optionally substituted aryl containing from 6 to 10 nuclear carbon atoms, R^7 and R^8 are independently hydrogen, (C_1–C_{10}) alkyl, (C_1–C_{10}) haloalkyl, (C_3–C_6) cycloalkyl, (C_2–C_{11}) alkoxyalkyl, (C_1–C_{10}) cyanoalkyl, (C_3–C_6) alkenyl, (C_3–C_6) haloalkenyl, (C_3–C_6) alkynyl, (C_3–C_6) haloalkynyl, optionally substituted aralkyl of from 7 to 11 carbon atoms, optionally substituted (C_6–C_{10}) aryl; R^9 is R″, OR″, N(R″)$_2$ or SR″ and R^{10} is R″, N(R″)$_2$ or SR″ wherein R″ is an aliphatic group of from 1 to 18 carbon atoms or optionally substituted aryl containing from 6 to 10 nuclear carbon atoms provided that R^9 and R^{10} are not simultaneosly R″; R^{11} is an aliphatic group of from 1 to 18 carbon atoms or optionally substituted aromatic group containing from 6 to 10 carbpn atoms in the aromatic ring; *n*′ is an integer of 0 to 1; Y is carbonyl, sulfinyl or sulfonyl and the pharmaceutically acceptable metal salts, acid salts and metal salt complexes thereof.

13. An anthelmintic composition for oral administration comprising an effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

27. The method for combatting a helminth infection in a host animal which comprises administering an effective amount of the compound of claim 1.

4,086,337
O,S-DIALKYL O(S)-SULFONYLOXY(THIO)PHENYL PHOSPHOROTHIOLATES AND PHOSPHORODI(TRI)THIOATES

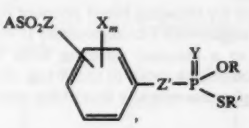
William S. Hurt, Collegeville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Jun. 16, 1976, Ser. No. 696,470

Int. Cl.[2] C07C 143/48; A01N 9/36

U.S. Cl. 424—215 15 Claims

1. A compound of the formula:



wherein

R is a (C_1–C_4) alkyl group;

R′ is a (C_3–C_6) alkyl group;

Y is an oxygen or sulfur atom;

Z is an oxygen or sulfur atom;

Z′ is an oxygen or sulfur atom, provided that Z and Z′ are not simultaneously oxygen atoms;

X is a halogen atom, a (C_1–C_3) alkyl group, or a (C_1–C_3) alkoxy group;

m is an integer from 0 to 3; and

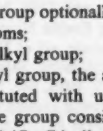
A is

a. a (C_1–C_6) alkyl group optionally substituted with up to three halogen atoms;

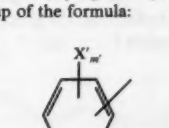
b. a (C_5–C_6) cycloalkyl group;

c. a (C_7–C_{11}) aralkyl group, the aryl portion of which is optionally substituted with up to three substituents selected from the group consisting of halogen, nitro, (C_1–C_3) alkyl and (C_1–C_3) alkoxy; or

d. an aryl group of the formula:



or



wherein

X′ is a nitro group, a halogen atom, a (C_1–C_3) alkyl group, or a (C_1–C_3) alkoxy group; and

m′ is an integer from 0 to 3.

4,086,338

N-CARBOXYALKANOYL DERIVATIVES OF AZETIDINE-2-CARBOXYLIC ACID

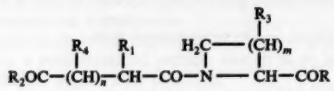
David W. Cushman, West Windsor, and Miguel Angel Ondetti, Princeton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 657,793, Feb. 13, 1976, Pat. No. 4,052,511. This application Feb. 11, 1977, Ser. No. 767,708

Int. Cl.[2] C07D *205/04;* A61K *31/395, 31/40;* C07D *207/16*

U.S. Cl. 424—244 19 Claims

1. A compound of the formula



wherein

R is hydroxy, amino or lower alkoxy;

R_1 and R_4 each is hydrogen, lower alkyl or phenyl-lower alkyl;

R_2 is hydroxy, amino, hydroxyamino or lower alkoxy;

R_3 is hydrogen, hydroxy or lower alkyl;

m is 1;

n is 0, 1 or 2

and salts thereof.

19. A method for reducing blood pressure by inhibiting the conversion of angiotensin I to angiotensin II which comprises administering to a mammal suffering from hypertension a composition comprising about 10 to 500 mg. of a compound of claim 1 and a pharmaceutically acceptable vehicle therefor.

4,086,339

METAL COMPLEXES OF ANTIMICROBIC EFFECT

György Matolcsy; Barna Bordás, both of Budapest; György Bokor, Miskolc; Zsolt Dombay, Miskolc; Zoltán Pintér, Miskolc; Erzsébet Gregar, née Tóth, Miskolc; Julianna Dudás, née Sz. Kiss, Miskolc; Emiliá Nagy, née Gera, Sajobabony, and István Fodor, Miskolc, all of Hungary, assignors to Eszakmagyarorszagi Vegyimuvek, Sajobabony, Hungary

Filed Dec. 9, 1975, Ser. No. 639,100

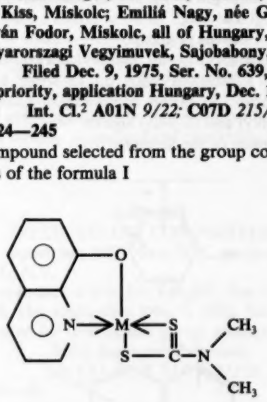
Claims priority, application Hungary, Dec. 11, 1974, EA 140

Int. Cl.[2] A01N *9/22;* C07D *215/00*

U.S. Cl. 424—245 8 Claims

1. A compound selected from the group consisting of metal complexes of the formula I

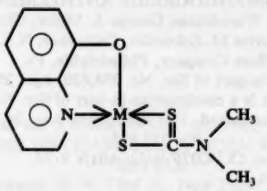
(I)



wherein M is a divalent metal atom, and mixtures thereof.

3. A composition for inhibiting growth of a microorganism selected from the group consisting of fungi and bacteria comprising (a) an amount sufficient to inhibit the growth of said organism of a compound selected from the group consisting of metal complexes of the formula I

(I)



wherein M is a divalent metal atom, and mixtures thereof and (b) a carrier therefor.

4,086,340

CEPHALOSPORINS AND THEIR PRODUCTION

Wilfried Schröck; Hans-Bodo Konig; Michael Preiss; Karl Georg Metzger, all of Wuppertal, and Michael Walkowiak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

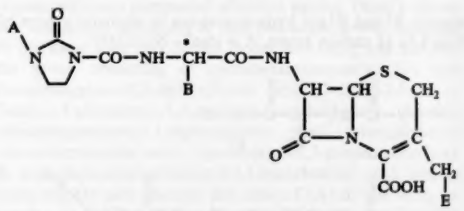
Division of Ser. No. 590,794, Jun. 27, 1975, which is a continuation-in-part of Ser. No. 548,347, Feb. 10, 1975, abandoned. This application May 12, 1976, Ser. No. 685,706

Claims priority, application Germany, Feb. 18, 1974, 2407715

Int. Cl.[2] A61K *31/545;* C07D *501/34*

U.S. Cl. 424—246 20 Claims

1. A compound selected from the group consisting of a cephalosporin derivative of the formula:



the nontoxic salts thereof and the hydrates thereof wherein the carbon atom designated * constitutes a center of chirality;

E is hydrogen; hydroxy; or acetoxy;

B is phenyl; methylphenyl; chlorophenyl; hydroxyphenyl; or cyclohexa-1,4-dien-1-yl; and

A is phenyl or naphthyl unsubstituted or substituted by one to five substituents selected from the group consisting of halo, cyano, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, and alkylsulfamyl of 1 to 4 carbon atoms.

14. A pharmaceutical composition useful for treating bacterial infections in humans and animals which comprises an antibacterially-effective amount of a compound of claim 1 in combination with a pharmaceutically acceptable nontoxic, inert diluent or carrier.

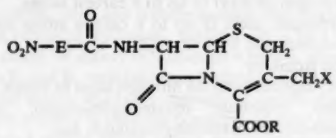
15. A method of treating bacterial infections in humans and animals which comprises administering to such human or animal an antibacterially-effective amount of a compound of claim 1.

4,086,341
CEPHALOSPORIN DERIVATIVES

Wolfgang Krohn, Leverkusen; Karl Georg Metzger; Michael Preiss, both of Wuppertal, and Michael Walkowiak, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 602,969, Aug. 8, 1975, Pat. No. 4,012,518. This application Jul. 22, 1976, Ser. No. 707,853
Claims priority, application Germany, Aug. 22, 1974, 2440268
Int. Cl.[2] C07D *501/20;* A61K *31/545*
U.S. Cl. 424—246 13 Claims

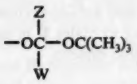
1. A compound selected from the group consisting of a nitro-β-lactam of the formula:



wherein

O_2N—E— is nitroalkyl of 1 to 6 carbon atoms;

R is hydrogen or



in which each of Z and W is independently hydrogen or lower alkyl; and X is hydrogen, hydroxy, acetoxy, carbamoyl,

and the pharmaceutically acceptable salts of said lactams in which R is hydrogen.

9. A pharmaceutical composition comprising an antibacterially effective amount of a compound according to claim 1 in combination with a pharmaceutical carrier.

4,086,342
6-(1-PIPERAZINYL)MORPHANTHRIDINE AS A SLEEP INDUCING OR PROLONGING AGENT

Horst Kleinlogel, Hinterkappelen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 653,971, Jan. 30, 1976, abandoned. This application Feb. 18, 1977, Ser. No. 770,218
Claims priority, application Switzerland, Feb. 5, 1975, 1395/75
Int. Cl.[2] A61K *31/495*
U.S. Cl. 424—250 10 Claims

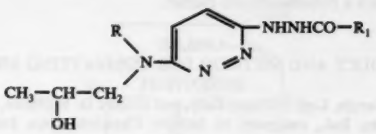
1. A method for inducing, or prolonging sleep in animals, which comprises administering a sleep inducing, or prolonging effective amount of the compound 6-(1-piperazinyl)morphantridine to an animal in need of such treatment.

4,086,343
ACYLATED HYDRAZINOPYRIDAZINE ANTIHYPERTENSIVES

Luciano Dorigotti, and Francesco Parravicini, both of Milan, Italy, assignors to I.S.F. SpA, Milan, Italy

Filed Jun. 7, 1977, Ser. No. 804,272
Claims priority, application Italy, Jun. 11, 1976, 24177/76
Int. Cl.[2] C07D *237/20;* A61K *31/50*
U.S. Cl. 424—250 10 Claims

1. A hydrazinopyridazine compound of the formula:



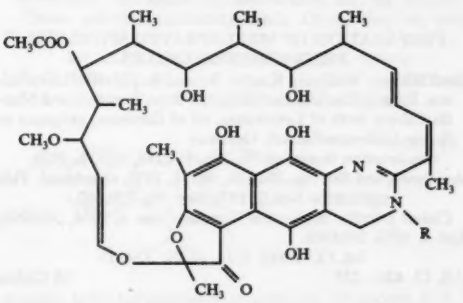
wherein R is an alkyl radical containing from 1 to 4 carbon atoms or an alkyl radical having from 1 to 4 carbon atoms substituted iwith a hydroxy group and R_1 is a hydrogen atom, an alkyl radical containing from 1 to 4 carbon atoms, a phenyl or 3-pyridyl group and their non-toxic pharmaceutically acceptable salts with inorganic or organic acids.

4,086,344
N,15-DIDEHYDRO-15-DEOXO-3,15-EPI(METHANO(ALKYLIMINO))RIFAMYCINS AND ANTIMICROBIAL COMPOSITIONS AND METHODS EMPLOYING THEM

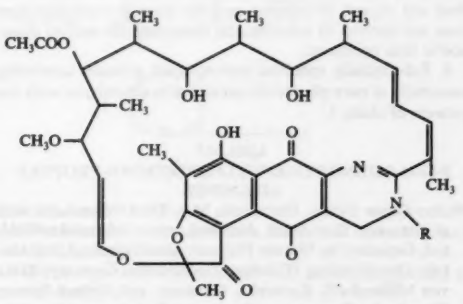
James R. McCarthy, and Jimmie L. Moore, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 13, 1976, Ser. No. 722,455
Int. Cl.[2] A61K *31/505*
U.S. Cl. 424—251 6 Claims

1. A compound which, in the hydroquinone form, is represented by the formula



and, in the quinone form, is represented by the formula



wherein R represents H, CH_3 or n-propyl.

5. An antimicrobial method wherein an antimicrobially-effective amount of a compound as claimed in claim 1 is applied to a microorganism or to the habitat of said microorganism.

6. An antimicrobial composition comprising an antimicro-

bial amount of a compound as claimed in claim 1 in combination with a pharmaceutical carrier.

4,086,345

PRODUCT AND METHOD FOR COMBATTING SWINE DYSENTERY

Aldo Garzia, Lodi (Milan), Italy, and Robert D. Williams, Terre Haute, Ind., assignors to Istituto Chemioterapico Italiano, Italy

Continuation-in-part of Ser. No. 672,089, Mar. 31, 1976, abandoned. This application Feb. 28, 1977, Ser. No. 772,863

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **23 Claims**

1. A method of combatting swine dysentery comprising the prophylactic or therapeutic administration to the animal of an effective amount of a compound represented by the formula:

where R is hydrogen or lower alkyl.

4,086,346

PREPARATION OF MELT-SPRAYED SPHERICAL PHENACETIN GRANULES

Ernst Böcker; Wolfgang Kracht; Roland Rupp, all of Leverkusen; Erhard Schellmann, Cologne; Viktor Trescher, and Martin Ullrich, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 564,168, Apr. 1, 1975, abandoned, and Ser. No. 564,169, Apr. 1, 1975, abandoned. This application Sep. 7, 1976, Ser. No. 720,650

Claims priority, application Germany, Apr. 6, 1974, 2416903; Apr. 6, 1974, 2416904

Int. Cl.[2] A61K *9/16, 31/52, 31/165*

U.S. Cl. 424—253 **15 Claims**

1. A process for preparing melt-sprayed spherical phenacetin granules which comprises passing crystalline phenacetin through a melting device having heated surfaces maintained at temperatures of from 150 to 300° C at such a rate that the total residence time of the molten phenacetin in the melting device does not exceed 20 minutes and the average residence time does not exceed 10 minutes, and atomizing the melted phenacetin thus produced.

6. Substantially spherical melt-sprayed granules consisting essentially of pure phenacetin produced in accordance with the process of claim 1.

4,086,347

9-[3-(4-PHENOXYMETHYLPIPERIDINO)-PROPYL]-ADE-NINES

Walter-Gunar Friebe, Darmstadt; Max Thiel, Mannheim, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Germany; by Werner Plattner, administrator, Linz, Austria; Otto-Henning Wilhelms, Heddesheim, Germany; Erika von Müllendorff, Karlsruhe, Germany, and Gisbert Sponer, Hemsbach, Germany, assignors to Boehringer Mannheim GmbH, Mannheim-Waldhof, Germany

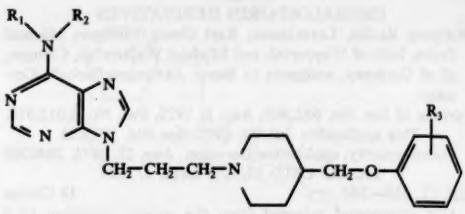
Filed Nov. 2, 1976, Ser. No. 737,507

Claims priority, application Germany, Nov. 7, 1975, 2550000

Int. Cl.[2] A61K *31/52;* C07D *473/34*

U.S. Cl. 424—253 **13 Claims**

1. A 9-[3-(4-phenoxymethylpiperidino)-propyl]-adenine of the formula



wherein

R_1 is hydrogen or alkyl of up to 6 carbon atoms,

R_2 is hydrogen, alkyl of up to 6 carbon atoms optionally mono-substituted by hydroxyl, or cycloalkyl of up to 6 carbon atoms, or

R_1 and R_2 together with the nitrogen atom to which they are attached constitute tetramethyleneimino, pentamethyleneimino or hexamethyleneimino, and

R_3 is hydrogen, halogen alkyl of up to 6 carbon atoms or alkoxy of up to 4 carbon atoms, in the form of the free base or a salt thereof with a pharmacologically compatible acid.

8. A composition comprising an anti-allergic, anti-inflammatory, anti-oedematous and anti-hypertensive effective amount of an adenine according to claim 1, in admixture with a pharmacologically compatible diluent.

4,086,348

NAPHTHYRIDINE DERIVATIVES

Claude Cotrel, Paris; Cornel Crisan, Sceaux; Claude Jeanmart, Brunoy, and Andre Leger, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

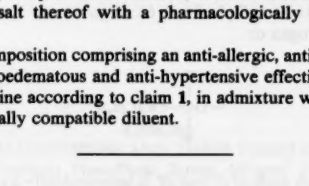
Filed Apr. 5, 1976, Ser. No. 673,868

Claims priority, application France, Apr. 7, 1975, 75 10756

Int. Cl.[2] A61K *31/435;* C07D *471/04*

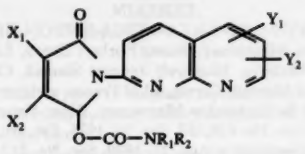
U.S. Cl. 424—256 **29 Claims**

1. A heterocyclic compound of the formula:



wherein the pyrroline ring and the symbols X_1 and X_2 together form an isoindoline nucleus or an isoindoline nucleus substituted by one or two atoms or radicals selected from halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, nitro and trifluoromethyl; the symbols Y_1 and Y_2 each represent hydrogen, halogen, alkyl of 1 through 4 carbon atoms, or alkoxy of 1 through 4 carbon atoms, and the symbols R_1 and R_2 each represent hydrogen; alkyl of 1 through 12 carbon atoms; alkyl of 1 through 12 carbon atoms substituted by a member of the class consisting of hydroxy, alkoxy of 1 through 4 carbon atoms, amino, monoalkylamino of which the alkyl radical has 1 through 4 carbon atoms, dialkylamino of which each alkyl radical has 1 through 4 carbon atoms or the alkyl radicals together with the nitrogen atom to which they are attached form a saturated five- or six-membered heterocyclic ring, and alkoxycarbonyl of which the alkoxy radical has 1 through 4 carbon atoms; alkenyl of 3 or 4 carbon atoms; alkynyl of 3 or 4 carbon atoms; or cycloalkyl of 3 through 6 carbon atoms, and when appropriate non-toxic pharmaceutically acceptable acid addition salts thereof.

27. A heterocyclic compound of the formula:



wherein the pyrroline ring and the symbols X_1 and X_2 together form an isoindoline nucleus or an isoindoline nucleus substituted by one or two atoms or radicals selected from halogen, alkyl of 1 through 4 carbon atoms, alkoxy of 1 through 4 carbon atoms, nitro and trifluoromethyl; the symbols Y_1 and Y_2 each represent hydrogen, halogen, alkyl of 1 through 4 carbon atoms, or alkoxy of 1 through 4 carbon atoms, and the symbols R_1 and R_2 each represent hydrogen; alkyl of 1 through 12 carbon atoms; alkyl of 1 through 12 carbon atoms substituted by a member of the class consisting of hydroxy, alkoxy of 1 through 4 carbon atoms, amino, monoalkylamino of which the alkyl radical has 1 through 4 carbon atoms, dialkylamino of which each alkyl radical has 1 through 4 carbon atoms or the alkyl radicals together with the nitrogen atom to which they are attached form a saturated five- or six-membered heterocyclic ring, and alkoxycarbonyl of which the alkoxy radical has 1 through 4 carbon atoms; alkenyl of 3 or 4 carbon atoms; alkynyl of 3 or 4 carbon atoms; or cycloalkyl of 3 through 6 carbon atoms, or R_1 and R_2 together with the nitrogen atom to which they are attached form a piperidino or pyrrolidino ring, and when appropriate non-toxic pharmaceutically acceptable acid addition salts thereof."

4,086,349

QUINOLOPYRAN-4-ONE-2-CARBOXYLIC ACID DERIVATIVES AND SALTS THEREOF AS NOVEL COMPOUNDS AND AS MEDICINES FOR TREATMENT OF ALLERGIC ASTHMA

Yasuhiro Morinaka, and Kazuo Takahashi, both of Ibaraki, Japan, assignors to Mitsubishi Yuka Pharmaceutical Co., Ltd., Japan

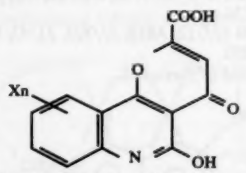
Filed Jul. 29, 1976, Ser. No. 709,779

Claims priority, application Japan, Jul. 30, 1975, 50-92939; Mar. 5, 1976, 51-23792

Int. Cl.[2] A61K *31/47;* **C07D** *491/04*

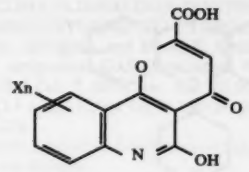
U.S. Cl. 424—258 **40 Claims**

1. A quinolopyran-4-one-2-carboxylic acid of the formula



wherein X designates a member selected from the group consisting of non-tertiary alkyl groups having 1 to 5 carbon atoms, alkoxy groups having 1 to 5 carbon atoms, a halogen atom, aryl-substituted alkoxy groups having 7 to 10 total carbon atoms wherein aryl is phenyl, tolyl or xylyl, alkoxycarbonyl groups having 2 to 6 total carbon atoms, phenyl, tolyl and xylyl and *n* is 1 or 2 thereof.

23. A medicinal composition for treatment of allergic asthma comprising an amount effective for treatment of allergic asthma of a member selected from the group consisting of quinolopyran-4-one-2-carboxylic acids of the formula



wherein X designates a member selected from the group consisting of non-tertiary alkyl groups having 1 to 5 carbon atoms, alkoxy groups having 1 to 5 carbon atoms, a halogen atom, aryl-substituted alkoxy groups having 7 to 10 total carbon atoms, alkoxycarbonyl groups having 2 to 6 total carbon atoms, and aryl groups having 6 to 10 carbon atoms, and *n* is 1 or 2, X being the same group or different groups in the case where *n* is 2, and salts of said derivatives; and a pharmaceutically acceptable carrier.

4,086,350

PHARMACEUTICAL COMPOSITIONS AND METHOD OF PRODUCING ANTI-PSYCHOTIC ACTIVITY WITHOUT EXTRAPYRAMIDAL SYMPTOMS

Charles Leon Zirkle, Berwyn, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 521,216, Nov. 6, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,587

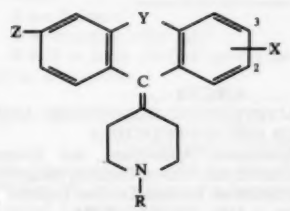
Claims priority, application South Africa, Oct. 16, 1975, 75/6550

Int. Cl.[2] A61K *31/445;* **C07D** *405/04, 409/04*

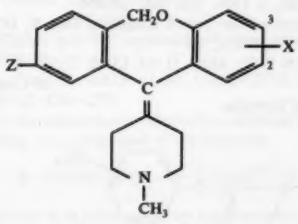
U.S. Cl. 424—267 **17 Claims**

1. A compound represented by one of the formulas:

FORMULA I



FORMULA II



wherein, for formula I:

when Y represents oxygen, X is 2-fluoro, Z is 6-chloro and R is methyl;

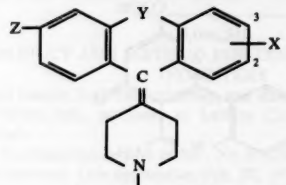
when Y represents sulfur, X is 2-cyano, Z is hydrogen and R is methyl; and

for formula II:

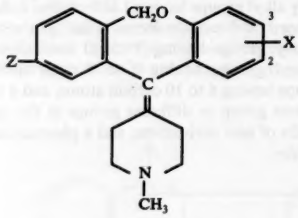
when X is hydrogen, Z is 9-chloro, or a nontoxic pharmaceutically acceptable acid addition salt thereof.

10. A method of producing antipsychotic activity without extrapyramidal symptoms which comprises administering internally to an animal in need of such activity a therapeutically effective amount of a compound represented by one of the formulas:

FORMULA I



FORMULA II



wherein, for formula I:

when Y represents oxygen, X is 2-chloro, Z is hydrogen and R is methyl;

when Y represents sulfur, X is 2-cyano, Z is hydrogen and R is methyl;

when Y represents oxygen, X is 2-fluoro, Z is 6-chloro and R is methyl;

for formula II:

when X is hydrogen, Z is 9-chloro, or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,086,351

1,2,4-TRIAZOLE-CONTAINING COMPOUNDS AND THEIR USE AS PESTICIDES

Sugavanam Balasubramanyan, Wokingham, and Margaret Claire Shephard, Maidenhead, both of England, assignors to Imperial Chemical Industries Limited, London, England

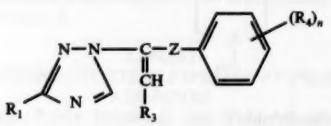
Filed Oct. 5, 1976, Ser. No. 729,864

Claims priority, application United Kingdom, Oct. 9, 1975, 41449/75; Aug. 20, 1976, 34836/76

Int. Cl.² A01N *9/00*; A61K *31/41*; C09B *23/00*

U.S. Cl. 424—269 **11 Claims**

1. A compound of formula:



wherein R_1 is hydrogen, or nitro; R_3 is alkyl or R_3 is furyl, thienyl or phenyl optionally substituted with halogen, acyloxy, cyano, hydroxy, nitro, alkoxy or unsubstituted or halo-substituted alkyl; R_4 is hydrogen, halogen, nitro, phenyl, alkoxy or unsubstituted or halo-substituted alkyl; n is 1, 2 or 3; and Z is C = O, or a fungicidal salt of such a compound.

7. A method of combating fungal diseases in a plant, the method consisting essentially of the step of applying to the plant, to seed of the plant or to the locus of the plant or seed, a fungicidally effective amount of a compound or salt as claimed in claim 1.

4,086,352

CERTAIN 6-ARYLOXY-2-OXO-1-AZA-4-THIA-SPIRO[4,5]DECANES

Roland Yves Mauvernay, Riom; Norbert Busch, La Tourette; Jacques Moleyre, Menetrol; Jacques Simond, Chamalieres, and André Monteil, Gerzat, all of France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

Division of Ser. No. 616,357, Sep. 24, 1975, Pat. No. 4,000,292. This application Aug. 25, 1970, Ser. No. 717,716

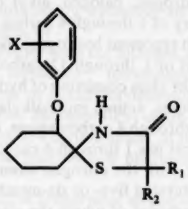
Claims priority, application France, Sep. 27, 1974, 74 32777; Aug. 4, 1975, 75 24296

Int. Cl.² A61K *31/425*; C07D *277/14*

U.S. Cl. 424—270 **6 Claims**

1. A compound of the formula

(I)



in which

R_1 is hydrogen or methyl,

R_2 is hydrogen, methyl or phenyl, and

X is hydrogen, a halogen atom or methyl.

5. A central nervous system stimulating composition, which comprises, as active ingredient, an amount of a compound as defined in claim 1 sufficient to stimulate the central nervous system, in combination with a pharmaceutically acceptable vehicle.

6. A method for stimulating the central nervous system which comprises administering to the patient an amount of a compound as described in claim 1 sufficient to stimulate the central nervous system.

4,086,353

CERTAIN AZOLINYLAMINO (AZOLIDINYLIMINO) INDAZOLES

Peter Neumann, Bern, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Nov. 26, 1976, Ser. No. 745,303

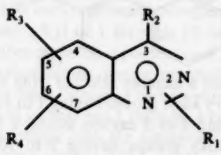
Claims priority, application Switzerland, Dec. 3, 1975, 15716/75; Jul. 20, 1976, 9279/76; Dec. 22, 1975, 16645/75; Jul. 21, 1976, 9312/76

Int. Cl.² C07D *417/12*; A61K *31/425, 31/42*; C07D *413/12*

U.S. Cl. 424—272 **105 Claims**

1. A compound of formula I,

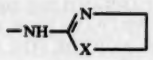
I



wherein

R_1 is hydrogen, or alkyl of 1 to 4 carbon atoms, in position 1 or 2 of the indazole nucleus,

R_2 is hydrogen, halogen, trifluoromethyl, hydroxy or alkyl, alkylthio or alkoxy of 1 to 4 carbon atoms, or a group of formula II,



II

wherein X is oxygen or sulphur, R_3 is hydrogen, halogen, trifluoromethyl, hydroxy or alkyl, alkylthio or alkoxy of 1 to 4 carbon atoms, and

R_4 is hydrogen or a group of formula II, as defined above, with the proviso that one of R_2 and R_4 is a group of formula II and the other of R_2 and R_4 is other than a group of formula II,

in free base form or in pharmaceutically acceptable acid addition salt form.

2. A pharmaceutical composition useful as an antihypertensive or a myotonolytic comprising an antihypertensive or a myotonolytic effective amount of a compound of claim 1 in association with a pharmaceutical carrier or diluent.

3. A method of treating spastic conditions, or relaxing muscles, or hypertonia which comprises administering a myotonolytic or antihypertensive effective amount of a compound of claim 1 to an mammal in need of such treatment.

4,086,354
NOVEL ANTI-HYPERTENSIVE COMPOSITIONS

Alexander Scriabine, Ambler, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 657,825, Feb. 13, 1976, Pat. No. 4,055,645. This application Feb. 8, 1977, Ser. No. 766,635

Int. Cl.² A61K *31/415, 31/195*

U.S. Cl. 424—273 R **6 Claims**

1. A pharmaceutical composition for treating hypertension comprising

(a) a hypotensive agent selected from trimethaphan camsylate, clonidine and pharmaceutically acceptable salts thereof and

(b) racemic mixture or L-isomer of a hydrazino phenyl propionic acid decarboxylase inhibitor, in an effective amount.

4,086,355
NOVEL DISPIRODECANES, PROCESSES FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS

Michel Vincent, Bagneux; Georges Remond, Versailles, and Jean-Claude Poignant, Bures sur Yvette, all of France, assignors to Science Union et Cie., Societe Francaise de Recherche Medicale, Suresnes, France

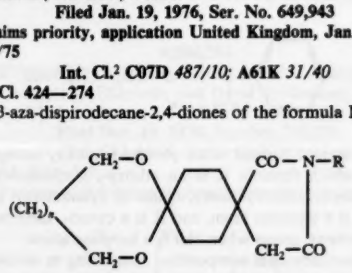
Filed Jan. 19, 1976, Ser. No. 649,943

Claims priority, application United Kingdom, Jan. 24, 1975, 3251/75

Int. Cl.² C07D *487/10*; A61K *31/40*

U.S. Cl. 424—274 **10 Claims**

1. 3-aza-dispirodecane-2,4-diones of the formula I:



I

in which

n is zero or an integer of from 1 to 3,

R is hydrogen, a lower alkyl having from 1 to 6 carbon atoms, a monosubstituted lower alkyl radical wherein the substituent is a member selected from the group consisting of hydroxy, lower alkoxy and dilower alkyl amino; a cyclohexyl; an aryl lower alkyl wherein the aryl radical is a member selected from the group consisting of phenyl, methoxyphenyl, trifluoromethylphenyl and chlorophenyl, and lower alkenyl having 2 to 6 carbon atoms.

4,086,356
FUNGICIDAL-N-(3-HALO-2,6-DINITRO-4-TRIFLUOROMETHYLPHENYL)-PYRROLIDONES

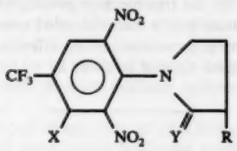
Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Feb. 7, 1977, Ser. No. 765,904

Int. Cl.² A61K *31/40*; C07D *207/24, 207/26*

U.S. Cl. 424—274 **11 Claims**

1. N-(3-halo-2,6-dinitro-4-trifluoromethylphenyl)pyrrolidones having the formula:



where

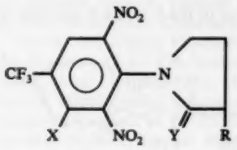
X is a halogen,

Y is oxygen or sulfur, and

R is H or lower alkyl, of up to 4 carbon atoms.

11. A fungicidal composition of matter comprising:

(a) a fungicidally effective amount of a N-(3-halo-2,6-dinitro-4-trifluoromethylphenyl)-pyrrolidone having the formula:



where

X is a halogen,

Y is oxygen or sulfur, and

R is H or lower alkyl, of up to 4 carbon atoms and

(b) an inert carrier.

4,086,357
AMIDE DERIVATIVES

Michael Stewart Large, and Leslie Harold Smith, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Nov. 26, 1976, Ser. No. 745,163

Claims priority, application United Kingdom, Dec. 5, 1975, 50038/75

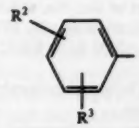
Int. Cl.² A61K *31/34, 31/38*; C07D *307/54, 333/24*

U.S. Cl. 424—275 **9 Claims**

1. An ethanolamine derivative selected from the group consisting of a compound of the formula:

$$R—CHOH.CH_2NH—A—CO—NR^{20}—Y—R^1$$

wherein A is alkylene of up to 12 carbon atoms, wherein R is aryl of the formula:



wherein R^{20} is hydrogen or alkyl of up to 6 carbon atoms, Y is a direct link, alkylene of up to 6 carbon atoms or alkyleneoxy of from 2 to 6 carbon atoms, and R^1 is furyl or thienyl; wherein R^2 and R^3, which may be the same or different, each is hydrogen, halogen, amino, nitro or cyano, alkyl, hydroxyalkyl, cy-

cloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms, or aryl, aryloxy or dialkylamino each of up to 12 carbon atoms; or wherein R^2 and R^3 together form trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; and a non-toxic, pharmaceutically-acceptable acid-addition salt thereof.

8. A method for the treatment or prophylaxis of heart diseases and hypertension in a warm-blooded animal which comprises administering to said animal an effective amount of at least one compound claimed in claim 1.

4,086,358

PURIFICATION OF UTERO-EVACUANT EXTRACTS FROM PLANT SUBSTANCES

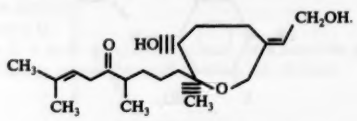
Michael P. Wachter, Bloomsbury, and Ramesh Maganlal Kanojia, Somerville, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation-in-part of Ser. No. 547,415, Feb. 6, 1975, abandoned. This application Apr. 2, 1976, Ser. No. 672,918

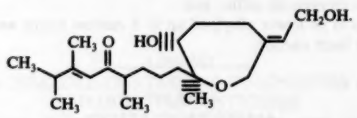
Int. Cl.² A61K *31/335;* **C07D** *325/00*

U.S. Cl. 424—278 **8 Claims**

1. A compound of the formula in purified form



2. A compound of the formula in purified form



3. A method of inducing uterine contractions which comprises administering to a female animal an effective amount of the compound of claim 1.

8. A method of treating disorders of the central nervous system in mammals which comprises administering an effective amount of a compound of claim 1.

4,086,359

DERIVATIVES OF PLEUROMUTILIN AND COMPOSITIONS

Friedrich Dürsch, Hopewell, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 618,087, Sep. 30, 1975, abandoned. This application Jul. 30, 1976, Ser. No. 709,983

Int. Cl.² A01N *9/24;* **C07C** *143/12*

U.S. Cl. 424—299 **9 Claims**

1. 14-Deoxy-14-[(2-diethylaminoethyl)mercaptoacetoxy]-mutilin neutral fumarate.

7. A method for treating bacterial infections in animals which comprises administering orally or parenterally to an animal with a bacterial infection about 1 to 50 mg./kg. of 14-deoxy-14-[(2-diethylaminoethyl)mercaptoacetoxy]mutilin neutral fumarate in a physiologically acceptable vehicle therefor.

4,086,360

PHENYL THIOL CARBANILIDE DERIVATIVES, METHOD FOR THE PREPARATION THEREOF AND USE THEREOF AS FUNGICIDE FOR AGRICULTURE

Taizo Nakagawa, Ageo; Kaoru Ohmori, Okegawa; Yutaka Watanabe, Saitama; Iwao Tejima, Ageo; Shuichi Ishida, Omiya; Toshiyuki Suzuki, and Osamu Yamada, both of Ageo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

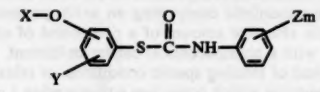
Filed Jun. 1, 1976, Ser. No. 691,602

Claims priority, application Japan, Jun. 11, 1975, 50-70304

Int. Cl.² A01N *9/12;* **C07C** *155/02*

U.S. Cl. 424—300 **6 Claims**

1. A compound represented by the formula



where X represents a lower alkylsulfonyl, a lower alkoxycarbonyl, a N-lower alkylcarbamoyl, a lower alkylcarbonyl or an 0,0-di lower alkyl thiophosphonyl, Y represents hydrogen, chlorine, bromine or a lower alkyl, Z represents hydrogen fluorine, chlorine, bromine, a lower alkyl, a lower alkoxy or trifluoromethyl and *m* represents 1 or 2.

4,086,361

AMINOETHYL OXIMES HAVING ANTI-DEPRESSIVE ACTIVITY

Hendricus Bernardus Antonius Welle, Utrecht, and Volkert Claassen, Weesp, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

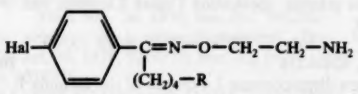
Filed Mar. 19, 1976, Ser. No. 668,479

Claims priority, application Netherlands, Mar. 20, 1975, 7503312

Int. Cl.² A61K *31/15, 31/275;* **C07C** *121/78, 131/00*

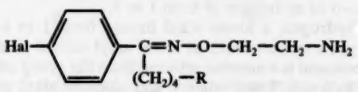
U.S. Cl. 424—304 **13 Claims**

1. Compounds of the formula



and salts thereof formed with pharmaceutically acceptable acids, in which formula R is an ethoxy-, methoxymethyl-, ethoxymethyl-, methoxyethoxy, cyano- or cyanomethyl group when Hal is a chlorine atom, and R is a cyano-, methoxy- or methoxy-ethoxy group when Hal is a bromine atom.

12. A pharmaceutical composition comprising an antidepressively effective amount of a compound of the formula



wherein R and Hal are defined as in claim 1 or a salt thereof formed with a pharmaceutically acceptable acid and a pharmaceutically acceptable carrier therefor.

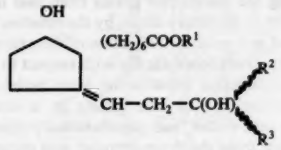
4,086,362

PROSTENOIC ACID DERIVATIVES

Manfred Baumgarth; Hans-Eckart Radunz; Dieter Orth; Reinhard Lissner; Hans-Joachim Enenkel, all of Darmstadt, Germany, and Filippus Johannes Zeelen, Heesch, Netherlands, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Filed Nov. 24, 1975, Ser. No. 634,349
Claims priority, application Germany, Nov. 27, 1974, 2455976
Int. Cl.[2] C07C *177/00*; A61K *31/19, 31/215*
U.S. Cl. 424—305 52 Claims

1. A prostenoic acid derivative of the formula



wherein,

R^1 is H or alkyl of 1 to 4 carbon atoms;

R^2 is alkyl of 5 to 9 carbon atoms;

R^3 is H or alkyl of 1 to 5 carbon atoms; and physiologically acceptable salts thereof.

4,086,363

TREATMENT OF ASTHMA

Peter P. Cervoni, New Rochelle, and Peter S. Wolf, Port Chester, both of N.Y., assignors to USV Pharmaceutical Corporation, Tuckahoe, N.Y.

Filed Mar. 16, 1977, Ser. No. 778,042
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 2 Claims

1. A method of treating asthmatic symptoms in a human in need of said treatment which comprises administering to said human an effective amount of p-hydroxy-N-(1-methyl-3-phenylpropyl)-nor-ephedrine or a pharmaceutically acceptable, non-toxic acid addition salt thereof.

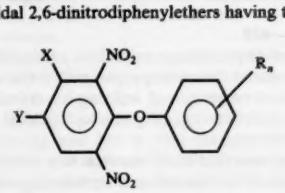
4,086,364

FUNGICIDAL 2,6-DINITRODIPHENYLETHERS

Louis Schneider, Elizabeth, and David E. Graham, Westfield, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Nov. 19, 1976, Ser. No. 743,279
Int. Cl.[2] A61K *31/04*; C07C *43/28*
U.S. Cl. 424—340 19 Claims

1. Fungicidal 2,6-dinitrodiphenylethers having the formula:



where

X is halogen,

Y is methyl or trifluoromethyl,

R is halogen or methyl, and

n is 0–3.

4,086,365

METHOD OF FEEDING LAYING HENS

David C. Snetsinger, and Ray A. Zimmerman, both of St. Louis, Mo., assignors to Ralston Purina Company, St. Louis, Mo.

Filed Oct. 26, 1976, Ser. No. 735,711
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—2 20 Claims

1. A method of feeding laying hens wherein nutrient reserves of said hens are reduced and replenished by the efficient utilization of dietary nutrients to promote the formulation of egg protein, which comprises:

feeding a first ration with an effective amount of crude protein and nutritionally balancing amounts of vitamins and minerals for an effective amount of time to reduce the hens' nutrient reserves without reducing their performance, and

feeding a second ration with an effective amount of crude protein and nutritionally balancing amounts of vitamins and minerals for an effective amount of time to replenish the hens' nutrient reserves to produce optimum egg production.

4,086,366

PRODUCTION OF VODKA

Sergei Fedorovich Antonov, ulitsa A. Tolstogo 18, kv. 34, Moscow; Pavel Firsovich Krasheninin, Krasnoarmeisky bulvar 14, kv. 5, Uglich Yaroslavskoi oblasti; Vyacheslav Mikhailovich Bogdanov, ulitsa Rustaveli 19, kv. 130, Moscow; Andrei Georgievich Khramtsov, ulitsa Lenina 399, kv. 14, Stavropol, and Gennady Efimovich Eremin, ulitsa Instrumentalnaya 10, kv. 32, Uglich Yaroslavskoi oblasti, all of U.S.S.R.

Filed May 19, 1976, Ser. No. 688,031
Int. Cl.[2] C12C *11/08*
U.S. Cl. 426—14 7 Claims

1. A process for the production of vodka from whey which comprises fermenting for a period of 48–72 hours pasteurized whey cooled to a temperature of 28° to 30° C with 15–20% by weight of at least one of the yeasts *Candida psuedotropicalis var. lactosa* 85, *Torulopsis sphaerica* "SK" and *Torulopsis sphaerica* "IIA", thereby forming a mash containing ethanol and products of proteolysis, recovering said ethanol and products of proteolysis from the resulting mash, rectifying the ethanol and purifying it from said products of proteolysis, diluting the purified ethanol to an ethanol content of 30 to 45% by weight by mixing the purified ethanol with deproteinized whey containing a maximum of 0.05% protein by weight.

4,086,367

FRUIT FLAVORED COMPOSITION

Salvatore F. Ziccarelli, Downers Grove, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

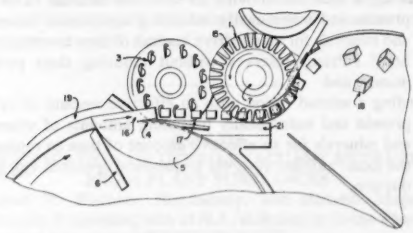
Continuation-in-part of Ser. No. 338,523, Mar. 6, 1973, Pat. No. 3,843,808. This application Sep. 26, 1974, Ser. No. 509,633
Int. Cl.[2] A23L *1/00, 1/06*; A23D *5/00*; A23C *21/00*
U.S. Cl. 426—98 12 Claims

1. A fruit-flavored, shelf-stable and self-preserving composition comprising 10 to 70% fruit flavors and 30 to 50% finely divided fat particles having an average particle size not greater than 0.5 millimeter, said fat having a melting point in the range of from 90° to 125° F and said fat particles being substantially coated with a fat enrobing agent wherein at least a part of the fat enrobing agent is dried yeast and whey and wherein the enrobing agent which prevents coalescing of the fat particles by preventing fat-to-fat contact of the fat particles constitutes from 1.0% to 20% of the composition and said composition has a moisture content of no more than 5% by weight.

4,086,368
METHOD FOR PREPARING AND TREATING VEGETABLE SEGMENTS

Roy E. Bosley; Paul T. Mann, both of Caldwell; Gary D. Decoteau, Nampa, all of Id., Kert F. Ivie, Franklin, Mass., and Elden D. Winslow, Caldwell, Id., assignors to J. R. Simplot, Boise, Id.

Continuation-in-part of Ser. No. 569,960, Apr. 21, 1975, abandoned. This application Sep. 16, 1976, Ser. No. 723,845
Int. Cl.[2] B26D 9/00; A23B 7/03
U.S. Cl. 426—464 8 Claims

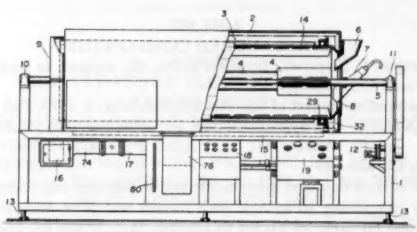


1. In the production of at least partially dehydrated vegetable segments of improved physical character for reconstitution, the improvement which comprises:
1. providing a machine having means for cutting elongated vegetable strips into segments and separate means for perforating said segments;
2. simultaneously by using said cutting means cutting elongated vegetable strips into segments and at the same time, by using said perforating means, making a plurality of holes in each of said segments, said holes extending from ¼ to all the way through said segments, the volume of the resulting holes being in the range of 0.5 to 50% of the volume of each segment and;
3. thereafter blanching the vegetable segments and subsequently dehydrating the blanched segments to less than about 75% moisture content on a dry weight basis.

4,086,369
PROCESS FOR FREEZING COOKED RICE

Fumio Mutoh, Tokyo; Hiroshi Koizumi, Sagamiwara; Jun Yamasaki, Tokyo, and Toshifumi Ando, Ninomiya, all of Japan, assignors to Japan Oxygen Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 608,605, Aug. 28, 1975, abandoned. This application Nov. 16, 1976, Ser. No. 742,301
Claims priority, application Japan, May 21, 1975, 50-60562
Int. Cl.[2] A23L 3/36; F25D 25/02
U.S. Cl. 426—519 4 Claims



1. A process for freezing cooked rice, by the use of a rotary drum having an inlet at one end and an outlet at the other end, comprising the steps of:
(a) jetting sufficient liquid refrigerant for freezing of boiled rice downwardly through said inlet of said rotary drum into said rotary drum in the vicinity of the inlet;
(b) feeding said boiled rice in a continuous manner through said inlet downwardly into said rotary drum, for allowing said boiled rice to be frozen by said refrigerant;
(c) carrying the boiled rice upwardly by mechanical means which rotates the drum while rotating the rotary drum at a circumferential speed within the range 0.4 – 0.9 m/s, and such that the rice falls onto rotary blades axially rotating in the rotary drum at a circumferential speed of about 3 – 10 m/s, and also onto the drum surface;
(d) while the boiled rice is in progress of freezing, imparting impact by said rotary blades to that portion of the boiled rice which falls onto the blades to separate grains of the boiled rice from one another into a scattered state;
(e) carrying the boiled rice grains from said inlet towards said outlet of the rotary drum, by the rotation of the rotary drum and as a result of inclination of the axis of rotation of the rotary drum downwardly with respect to the horizontal in the direction towards the drum outlet, discharging the separated boiled rice grains in a scattered state through said outlet, and simultaneously discharging the refrigerant from the drum through said outlet.

4,086,370
TOPPING FOR FROZEN DESSERTS AND METHOD OF MANUFACTURE

Dale F. Olds, Dublin; Arnold M. Allan, San Francisco, and Charles H. Warren, South San Francisco, all of Calif., assignors to Patent Technology, Inc., San Francisco, Calif.

Filed Feb. 3, 1977, Ser. No. 767,291
Int. Cl.[2] A23G 9/24
U.S. Cl. 426—613 11 Claims

1. An edible coating composition which is a homogeneous blend that is fluid at room temperature and which hardens as a brittle edible shell when applied to a frozen dessert consisting of from 44 to 53% refined edible oil that is substantially entirely liquid at 70° F., from 28 to 38% sugar, from 0 to 9% milk solids, from 4 to 10% corn syrup solids, from 1.8 to 2.4% hard crystallized emulsifier selected from the group consisting of monoglycerides, diglycerides and mixtures thereof, from 0.5 to 1.2% moisture, and the remainder flavoring additives.

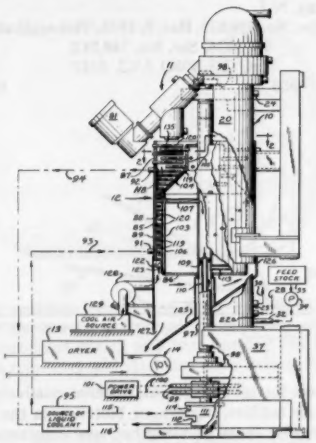
4,086,371
METHOD FOR MANUFACTURING CRYSTALLINE CONFECTIONERY FOOD PRODUCTS

Bernard W. Minifie, Bristol, England, and Ted S. Czyzewski, Bloomingdale, Ill., assignors to Dover Corporation, New York, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,846
Int. Cl.[2] A23G 3/00, 1/00
U.S. Cl. 426—658 8 Claims

1. A process of preparing a crystalline product from a liquid feed stock material comprising sugar, milk solids and a significant amount of moisture and utilizing a vertical evaporator having heated walls terminating at a top opening, said process comprising the steps of:
condensing said feed stock material to a readily crystallizable material by continuously introducing said feed stock material into the bottom of said evaporator and heating said material in said evaporator such that upon reaching said top opening it has a temperature of between about 121.1° C. and about 126.67° C. and a moisture content of between about 4% and 6%;
mechanically pushing said readily crystallizable material

away from said top opening to a given location spaced from said evaporator; and



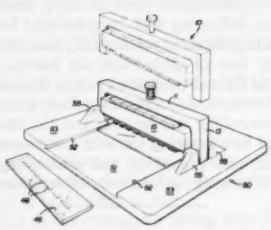
at said given location kneading said material removed from the evaporator while it crystallizes.

4,086,372

METHOD FOR APPLYING AN ORGANIC LIQUID SAMPLE

Tipton L. Golias, and David G. Mayes, both of Beaumont, Tex., assignors to Helena Laboratories Corporation, Beaumont, Tex.

Division of Ser. No. 620,736, Oct. 8, 1975, abandoned. This application Apr. 12, 1976, Ser. No. 676,182
Int. Cl.[2] A76B *19/00*
U.S. Cl. 427—2 4 Claims



1. A method of transferring uniform samples of blood or the like onto an absorbent sample support comprising the steps of:

filling a reservoir with a relatively massive sample;

superimposing over said reservoir a sample carrier wettable by the sample and to which the sample is adherent by surface tension;

said sample carrier including an elongated bar resiliently biased away from said reservoir and having a slot therethrough and at least one applicator element freely suspended from said bar and through said slot;

linearly moving said bar so that said applicator element moves solely under the influence of gravity to immerse the applicator element into the sample to adhere the sample to the applicator element;

withdrawing the applicator element from the reservoir by said resilient bias moving said bar with the sample adhered to the applicator element by surface tension; and

contacting said applicator element with an absorbent sample support to break the surface tension between the sample and the applicator element to deposit the sample onto the sample support.

4,086,373

PROTECTIVE POLYMERIC COATING FOR GLASS SUBSTRATE

John W. Tobias, Perrysburg, and Lynn J. Taylor, Toledo, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 2, 1975, Ser. No. 564,254
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—44 10 Claims

1. A process for forming a protective film on the surface of a glass substrate which comprises;

applying a polymeric crosslinkable coating composition to the glass substrate surface, the coating composition comprising 90 to 99.99% by weight of at least one rubbery thermoplastic organic polymer having an ultimate elongation of at least 100% and being solid at ambient temperature and 10 to 0.01% by weight of at least one organic photosensitizer,

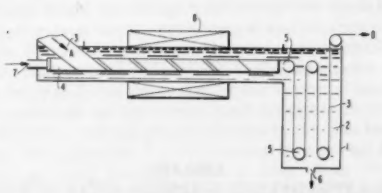
and applying radiant energy to the polymeric composition in situ on the substrate surface so as to crosslink the composition and form a protective polymeric film having a thickness sufficient to resist shattering of the glass substrate.

4,086,374

PRODUCTION OF MAGNETIC RECORDING MATERIAL

Masaaki Suzuki; Ryuji Shirahata; Masashi Aonuma, and Tatsuji Kitamoto, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 26, 1976, Ser. No. 680,418
Int. Cl.[2] H01F *10/00*
U.S. Cl. 427—48 14 Claims



1. In a plating process for producing a magnetic recording material which comprises a ferromagnetic thin metal layer on a web and having uniaxial anisotropy applied in any desired direction by passing said web through a liquid plating solution to deposit said layer on said web while applying a magnetic field to said web during at least a portion of said plating process, the improvement comprising the steps of:

conveying said web through said magnetic field in a helical path along the length of a conveying pipe immersed in said liquid plating solution, said pipe containing a plurality of orifices,

introducing said iiquid plating solution into one end of said pipe, and

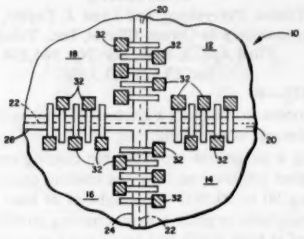
ejecting said liquid plating solution from inside said pipe through said orifices and against the adjacent surface of said web in said magnetic field with sufficient force to float said web out of contact with said pipe.

4,086,375

BATCH PROCESS PROVIDING BEAM LEADS FOR MICROELECTRONIC DEVICES HAVING METALLIZED CONTACT PADS

Theodore J. LaChapelle, Jr., Orange; John R. Davis, Costa Mesa, and James J. Licari, Whittier, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 7, 1975, Ser. No. 629,736
Int. Cl.[2] B05D 5/12; H01L 21/00
U.S. Cl. 427—90 12 Claims



1. A method of forming beam leads for a plurality of electronic devices fabricated on a wafer, the electronic devices having contact pads of a metal, said method comprising:

depositing a relatively thin layer of a removable release material on said wafer wherein said removable release material is susceptible to etching by etchants which do not react significantly with said metal;

selectively masking and etching said relatively thin layer of a removable release material to remove said release material from said contact pads;

depositing a relatively thick layer of said metal on said relatively thin layer of a removable release material and on said contact pads;

selectively masking and etching said relatively thick layer of said metal to form interdigitated beam leads for said electronic devices; and

removing the remainder of said removable release material from said wafer.

4,086,376

POLYPHENYLENE SULPHIDE APPLICATIONS

Glyndwr John Davies, London, England, assignor to The Glacier Metal Company Limited, Wembley, England

Filed Aug. 25, 1975, Ser. No. 607,501
Claims priority, application United Kingdom, Sep. 18, 1974, 40700/74
Int. Cl.[2] B05D 1/24, 3/02
U.S. Cl. 427—185 8 Claims

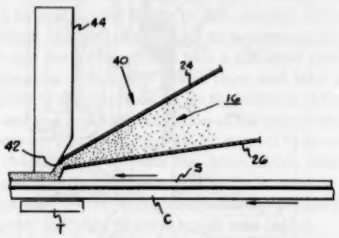
1. A method of applying a bearing lining at least 0.005 inch thick of polyarylene sulphide to a bearing backing, which comprises applying to said backing a powder composition consisting of at least 80% by weight of uncured polyarylene sulphide together with at least 10% by weight of precured polyarylene sulphide, said precured polyarylene sulphide having been cured by being heated in air for 2 hours at at least 400° C and is in the form of particles with sizes in the range 53–211 microns, and then heating and curing the uncured polyarylene sulphide of the coating by heating to a temperature of at least 380° C.

4,086,377

PROCESS FOR APPLYING FOAM MATERIAL

Henry J. Barchi, Yardley, Pa., assignor to Congoleum Corporation, Kearny, N.J.

Division of Ser. No. 639,035, Dec. 9, 1975. This application Nov. 22, 1976, Ser. No. 744,011
Int. Cl.[2] B05D 3/02, 3/12
U.S. Cl. 427—358 10 Claims



1. A process for spreading foam material relatively free of undesirable air bubbles, blisters, or blotches, in the form of large or irregular spots or blemishes, and substantially uniformly in thickness across the full width of continuously advancing sheet material comprising: supplying foam material having a predetermined density of from about 17 pounds per cubic foot to about 22 pounds per cubic foot to a chamber which does not increase in cross-sectional area and does, at least in part, gradually and constantly decrease uniformly at a steady rate to form a delivery nozzle; filling said chamber substantially completely with said foam material at said predetermined density; pumping said foam material forwardly within said chamber under a relatively low amount of pressure which does not exceed about five pounds per square inch gauge and wherein the pressure drop from the point of entry into said chamber to the point of exit therefrom does not exceed about five pounds per square inch gauge; maintaining the predetermined density of said foam material in said chamber substantially constant from point of entry thereto to point of exit therefrom; delivering said foam material from said chamber and spreading the same substantially uniformly in thickness and relatively free of undesirable air bubbles, blisters, and blotches, in the form of irregular spots or blemishes, across the full width of continuously advancing sheet material; and regulating and controlling the amount and the thickness of said foam material being spread on said continuously advancing sheet material, said regulating and controlling taking place immediately following said delivery of said foam material.

4,086,378

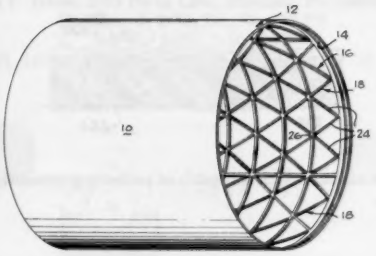
STIFFENED COMPOSITE STRUCTURAL MEMBER AND METHOD OF FABRICATION

Clifford Y. Kam; Vernon L. Freeman, both of Huntington Beach, and Allen P. Penton, Costa Mesa, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 20, 1975, Ser. No. 551,269
Int. Cl.[2] B32B 3/00
U.S. Cl. 428—36 32 Claims

1. A process for producing a stiffened structural member which comprises molding a stiffening member formed of a composite of reinforcing fibers and polymeric binder to a partially cured stage, said stiffening member comprised of interconnected webs forming a grid pattern, producing a composite structural member formed of partially cured polymer-impregnated fiber, heat forming said partially cured composite stiffening member to a contour matching the contour of said structural member, said heat forming taking place without any substantial further curing of said composite stiffening member, assembling said composite stiffening member in contact with said composite structural member, and finally curing simultaneously said composite stiffening member and said composite

structural member of said assembly to integrally bond said stiffening member to said structural member, and including introducing an elastomer into the spaces of said grid pattern



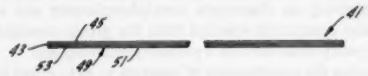
following molding thereof and prior to heat forming, said elastomer maintaining said partially cured composite stiffening member stabilized during said heat forming and final curing steps, and removing said elastomer after final curing.

4,086,379

MULTI-LAYERED LAMINATES

Lyman J. Brown, La Grange, Ill., assignor to Bates Printing Specialties, Inc., Cicero, Ill.

Filed Aug. 5, 1976, Ser. No. 711,727
Int. Cl.² B44C *1/16*
U.S. Cl. 428—40 **2 Claims**



1. A multi-layered item including:
a first sheet of paper,
a hot melt adhesive film releasably adhered to said first sheet of paper on a side thereof,
indicia located on an outwardly facing side of said hot melt adhesive,
a second sheet of paper releasably secured to the opposite side of said first sheet of paper by a pressure sensitive adhesive,
said pressure sensitive adhesive being applied so as to remain with said second sheet of paper when said sheets of paper are separated in order that said second sheet of paper may be adhered to other objects, and
indicia applied to the outwardly facing side of said second sheet of paper with said indicia applied to said second sheet of paper being substantially identical to said indicia located on the outwardly facing side of said hot melt adhesive.

4,086,380

GRANULAR DISC JOINTS FOR LENGTHWISE GRAPHITIZATION

Leslie Harrisville Juel, Lewiston, N.Y.; Louis Arpad Joo', Johnson City, and Kenneth Wayne Tucker, Elizabethton, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Filed Nov. 4, 1976, Ser. No. 738,671
Int. Cl.² B32B *3/02*
U.S. Cl. 428—65 **6 Claims**

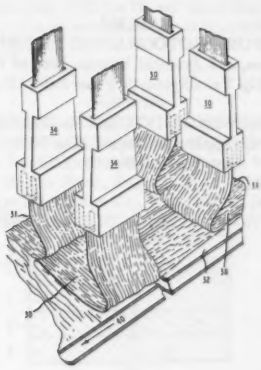
1. A planar disc shaped conductive spacer of about 0.25 to 1 inch thickness adapted to be inserted between the ends of coaxially placed carbon columns during resistance heating of the columns up to and including graphitizing temperatures, said spacer having an external shape equal to the shape of said columns joined thereby, said spacer being a cured mixture of about 50 to 85 volume percent of a carbon particle phase selected from the group consisting of metallurgical coke, graphitized petroleum coke, natural graphite, graphite scrap and mixtures thereof, dispersed in an organic binder phase selected from the group consisting of latex resin, plasticized thermoplastic resin and rubber cement, the final product being flexible and compressible and having sufficient structural integrity to be handled.

4,086,381

NONWOVEN POLYPROPYLENE FABRIC AND PROCESS

David Alan Cheshire; Samir Costandi Debbas, both of Hendersonville; Richard Thomas Eger, Madison, all of Tenn.; Ken Stephen Schermacher, Greenville, S.C., and Paul Thomas Twohig, Charlottesville, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 30, 1977, Ser. No. 782,961
Int. Cl.² B32B *5/12*
U.S. Cl. 428—113 **9 Claims**



1. A bonded, nonwoven sheet of continuous, isotactic polypropylene filaments having a breaking strength of at least 7 grams, said sheet consisting essentially of filaments and binder; said sheet having (a) a non-selvage portion in which filaments are interconnected at a multiplicity of points throughout said portion by bonds, the average bond strength for bonds having a strength greater than 0.1 gram being at least 0.9 gram and less than the fiber breaking strength, the bond strength distribution of said bonds having a variance of at least 4, the number of said bonds being such that the product of the number of bonds per cubic centimeter and the average bond strength is greater than 5×10^4 g/cm^3, and this product divided by the fiber breaking strength being less than 9×10^3 /cm^3 and (b) a selvage having an average bond strength which is from about 15–400% greater than the average bond strength of the non-selvage portion of said sheet.

4,086,382

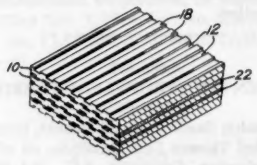
METHOD OF PRODUCING FIRE RESISTANT WOOD PRODUCTS AND PRODUCT THEREOF

Clifford C. Hites, Walkerton, Ind., assignor to American Door Company of Michigan, Inc., Walkerton, Ind.

Filed Jan. 5, 1977, Ser. No. 756,757
Int. Cl.² B32B *3/30, 3/00*
U.S. Cl. 428—168 **11 Claims**

1. In a process of making a fire resistant wood product, the steps of
assembling in stacked relation a plurality of thin strips of hard wood each having a plurality of indentations of a depth of 25% to 50% of the thickness of the strip in at least one face thereof in substantially uniformly and close spaced relation after coating of the surfaces and filling the

indentations of each strip which confronts another strip in the stack with a cement in which an inert non-flammable filler material has been substantially uniformly distributed in an amount from 30% to 40% by weight of the total weight of the cement, and



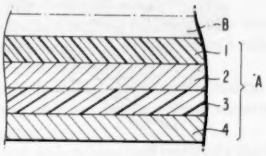
subjecting said stack of strips to heat and pressure for a period of time sufficient to set said cement and bond the strips of the stack in selected thickness.

4,086,383

SUPPORTS FOR PHOTOGRAPHIC PRINTING PAPER

Susumu Yamano, and Jyunichi Yasuda, both of Tokyo, Japan, assignors to Oji Yuka Synthetic Paper Sales Co., Ltd., Tokyo, Japan

Filed May 19, 1977, Ser. No. 798,540
Claims priority, application Japan, May 20, 1976, 51-57260
Int. Cl.² B32B *3/00, 5/02*
U.S. Cl. 428—174 **5 Claims**



1. A support for a photographic printing paper comprising
a. a polyolefin synthetic resin layer containing a white inorganic filler;
b. an opaque layer of a synthetic paper or a synthetic resin film;
c. a synthetic resin layer having a greater stiffness than the polyolefin synthetic resin layer (a); and
d. a layer of a synthetic paper or a synthetic resin film on which writing is possible; in this order, wherein the relative thickness of the polyolefin synthetic resin layer (a) is about 20% or less of the total thickness of the support and the relative thickness of the synthetic resin layer (c) having a greater stiffness than the polyolefin synthetic resin layer (a) is about 15% or higher of the total thickness of the support.

4,086,384

REFORCED PAPER-MICROFOAM SHEET PACKAGING MATERIAL

Herbert B. Adelman, Wilmington, Del., and Jack Goodman, Springfield, Pa., assignors to The Crowell Corporation, Newport, Del.

Filed Jul. 13, 1976, Ser. No. 704,980
Int. Cl.² B32B *7/02*
U.S. Cl. 428—213 **5 Claims**

1. A laminated sheet material comprising a relatively thin layer of paper material, a relatively thicker layer of a sealed cell microfoam polymer, a layer of strong adhesive material completely bonding the microfoam and paper layers together, and a layer of fiberglass strands inserted between the paper and microfoam layers and imbedded in the adhesive whereby an extremely strong tear-resistant and tear-stopping laminate is provided having an extremely smooth and protective microfoam surface which is capable of protecting extremely fine finishes.

4,086,385

FLAME RETARDED TEXTILES VIA DEPOSITION OF POLYMERS FROM OLIGOMERIC VINYLPHOSPHONATE AND POLYAMINO COMPOUNDS

Stanley P. Rowland, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 5, 1975, Ser. No. 629,478
Int. Cl.² C09D *5/18*; C09K *3/28*
U.S. Cl. 428—272 **11 Claims**

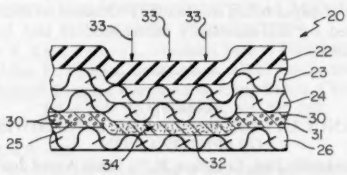
1. A process for imparting flame retardance to cellulosic textiles, the process comprising:
(a) impregnating a cellulosic textile with an aqueous solution containing an oligomeric vinylphosphonate and a polyamino compound selected from the group consisting of a polyethylenamine and a polyethylenimine, and
(b) curing the combination of reagents so as to effect interaction with one another in situ on said textile and yield a stable, insoluble, flame retardant finish.

4,086,386

SMASH-RECOVERABLE PRINTING BLANKET

Andrew J. Gaworowski, Waynesville, and John C. Duckett, Clyde, both of N.C., assignors to Dayco Corporation, Dayton, Ohio

Filed Oct. 12, 1976, Ser. No. 731,490
Int. Cl.² B32B *5/18*
U.S. Cl. 428—307 **10 Claims**

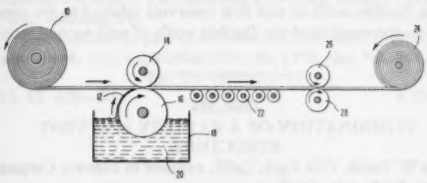


1. A smash-recoverable printing blanket having a substantially uniform thickness, said blanket comprising, a plurality of layers including at least one layer which swells upon being contacted by a liquid, and a plurality of microcapsules disposed within said blanket with said microcapsules containing said liquid, said microcapsules being ruptured upon smashing said blanket to thereby release said liquid contained therewithin against said one layer causing swelling thereof and restoring said adjacent layers substantially to their original positions prior to said smashing and define said uniform thickness.

4,086,387
HOT COMPRESSED FABRIC CONDITIONING PRODUCT

Rocco P. Triolo, 2512 Parke Lane, Broomall, Pa. 19008.

Filed Sep. 3, 1976, Ser. No. 720,269
Int. Cl.² B05D 5/00, 3/12
U.S. Cl. 428—311 14 Claims



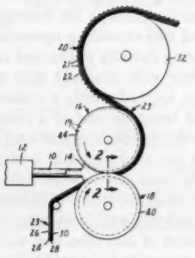
1. In the method of manufacturing a heat-activatable fabric conditioning product comprising impregnating an absorbent substrate having a thickness of at least 0.05 centimeters with at least about 2 ounces per square yard of absorbent substrate of a liquid fabric conditioner, solidifying the fabric conditioner and passing the absorbent substrate having the solidified fabric conditioner impregnated therein through a nip formed by two rollers having a gap between rollers preset to reduce the thickness of the absorbent substrate to about 70% or less than 70% of its original thickness as it passes through the nip, the improvement which comprises;

maintaining the rollers at an elevated temperature equal to or greater than the initial melting point of the fabric conditioner impregnated in the substrate.

4,086,388
RUBBERY CUSHION HAVING PRESSURE-SENSITIVE ADHESIVE LAYER

James N. Brown, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 16, 1977, Ser. No. 769,233
Int. Cl.² B32B 3/26
U.S. Cl. 428—315 10 Claims



1. An article of manufacture comprising

(a) a rubbery cushion comprising a thermoplastic elastomer composition including 2–200 parts of a plasticizing oil per 100 parts by weight of the elastomer,

(b) a chemically-interfacially-bonded dual-layer film 0.02 to 0.4 mm in thickness, one layer of which is a polyolefin which is fused to the rubbery cushion, the other layer of which is an oriented polyester polymer, and

(c) a pressure-sensitive adhesive layer adhered to the polyester polymer.

10. An article as defined in claim 1 wherein the pressure-sensitive adhesive layer incorporates a foam.

4,086,389
COATING COMPOSITION COMPRISING CRYSTALLINE CELLULOSE AND A COATED ELECTRODE FOR ARC WELDING PRODUCED THEREWITH

Takashi Tanigaki; Takeshi Koshio, both of Yokohama, and Yoshikazu Tanaka, Sagamihara, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 13, 1976, Ser. No. 676,403
Claims priority, application Japan, Apr. 23, 1975, 50/48645; Apr. 5, 1976, 51/37946
Int. Cl.² B05D 5/12; B23K 35/365; H05B 7/07
U.S. Cl. 428—385 2 Claims

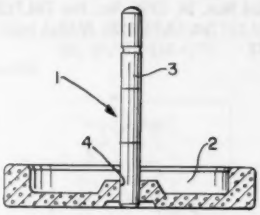
1. A coated electrode for arc welding comprising a steel core wire and a coating on said steel core, said coating comprising 3 to 30% of fibrous mineral, 2 to 12% of crystalline cellulose, with the balance being at least one of a slag forming agent, an arc stabilizing agent, a deoxidizing agent and an alloying agent.

2. A coated electrode according to claim 1, in which the coating further comprises at least one of Ni, Cr and Mo in an amount not more than 30% for Ni, not more than 10% for each of Cr and Mo and in an amount not more than 30% for the total of Ni, Cr and Mo.

4,086,390
FLYWHEEL FOR RECORDING AND OR REPRODUCING APPARATUS

Seishu Mitani, Kyoto; Tsuneo Kudo, Hachiouji; Minoru Mitani, Kyoto, and Shuichi Saido, Hasuda, all of Japan, assignors to Japan Powder Metallurgy Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1976, Ser. No. 724,377
Int. Cl.² B22F 5/00
U.S. Cl. 428—550 1 Claim



1. A flywheel assembly used for recording and reproducing devices, characterized in that said assembly comprises a flywheel and a capstan force-fitted therein, said capstan being formed of an iron casting, said flywheel comprising a pressed and sintered mixture of powders consisting of iron powder, graphite powder, zinc stearate powder and sulfur powder, particles of said iron powder being bonded to adjacent iron powder particles at limited points on their surfaces to form voids therebetween, said voids being distributed uniformly throughout the flywheel.

4,086,391
ALUMINA FORMING COATINGS CONTAINING HAFNIUM FOR HIGH TEMPERATURE APPLICATIONS

Charles Stanley Giggins, Jr., Simsbury, and Bernard Henry Kear, Madison, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 589,654, Jun. 23, 1975, Pat. No. 3,993,454.
This application Sep. 1, 1976, Ser. No. 719,874
Int. Cl.² B32B 15/18
U.S. Cl. 428—679 3 Claims

1. A method of protecting superalloy articles from oxidation/corrosion at elevated temperatures which comprises:

applying a layer of material to the surface of the article, said material having a thickness of from 0.001 to 0.010 inches

and consisting essentially of from about 10 to about 45 percent chromium, from about 6 to about 25 percent aluminum, from about 0.5 to about 3 percent hafnium, balance chosen from the group consisting of nickel, cobalt, and mixtures thereof.

4,086,392

METHOD FOR REDUCING THE FLOAT CURRENT OF MAINTENANCE-FREE BATTERY

George W. Mao, St. Paul, and Purushothama Rao, Burnsville, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.

Filed Jan. 26, 1977, Ser. No. 762,568
Int. Cl.[2] H01M *10/44*
U.S. Cl. 429—50 **15 Claims**

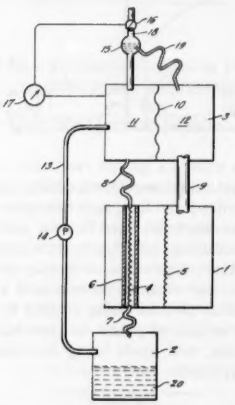
1. A method of reducing the gassing current during constant voltage overcharge in a maintenance-free battery comprising a sealed battery container except for venting means having a plurality of cells each including a plurality of positive and negative electrodes disposed therein comprising a grid structure having a layer of active material attached thereto and an electrolyte contained in the cells which comprises adding an additive consisting of zinc or a zinc compound to said electrolyte in an amount sufficient to decrease the gassing current during constant voltage overcharge, the amount of zinc corresponding to that provided by from about 0.1 to about 0.3% zinc sulfate, based upon the weight of the electrolyte, and at least the grid structure for the negative electrode consists of a lead alloy.

4,086,393

GAS PHASE FREE LIQUID CHLORINE ELECTROCHEMICAL SYSTEMS

Thomas G. Hart, Royal Oak, Mich., assignor to Energy Development Associates, Madison Heights, Mich.

Filed Nov. 24, 1976, Ser. No. 744,712
Int. Cl.[2] H01M *2/38*
U.S. Cl. 429—51 **9 Claims**



1. In the method of operating an electrochemical cell comprising a housing containing at least two electrodes by imposing an electric current across the electrodes and wherein chlorine is generated at at least one electrode, the improvement which comprises filling the housing with sufficient electrolyte such that the autogenous pressure is at least equal to that sufficient to liquify the chlorine as it is generated, and such that there is no space available for gas accumulation, before imposing said current, and causing said electrolyte to move thereby preventing liquid chlorine accumulation at the electrodes.

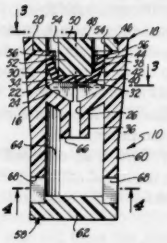
6. An electrochemical cell comprising a housing, at least two electrodes within said housing, a cation permselective membrane separating one of said electrodes so as to define a chlorine electrode compartment containing said separated electrode, a first electrolyte reservoir having flexible walls connected to said chlorine electrode compartment by a first conduit, a second electrolyte reservoir having flexible walls connected to said chlorine electrode compartment at a point spaced apart from said first conduit by a second conduit, and means to cause electrolyte to move between said first and second reservoirs and through said chlorine electrode compartment comprising means to vary the pressure on the outside of the flexible walls of said first reservoir relative to the pressure on the outside of the flexible walls of said second reservoir.

4,086,394

COMBINATION OF A BATTERY AND VENT STRUCTURE

Hugo W. Tesch, Villa Park, Calif., assignor to Elpower Corporation, Santa Ana, Calif.

Filed Sep. 23, 1976, Ser. No. 725,971
Int. Cl.[2] H01M *2/12*
U.S. Cl. 429—54 **6 Claims**



1. In the combination of a battery including a housing, and a vent for allowing the escape of gas from the interior of said housing, said vent being located adjacent to the top of said housing, the improvement which comprises:

said vent including a receptacle, a valve element and a retainer,

said receptacle being formed of a rigid material so as to include an internal cavity having a sloping bottom surrounded by an internal peripheral surface which extends upwardly from the periphery of said bottom, an open top, an opening extending through the lowermost part of said bottom downwardly through the bottom of said receptacle, a plurality of ribs extending upwardly from said bottom, said ribs being radially positioned on said bottom so as not to interfere with drainage into said opening and having their tops located within a common plane,

said valve element being formed of a resilient, elastomeric material so as to have a bottom wall and a peripheral wall attached to the periphery of said bottom wall so as to extend upwardly from said bottom wall,

said valve element being located within said cavity with said bottom wall of said valve element being positioned against said upper surfaces of said ribs, and with said peripheral wall extending upwardly from said bottom wall into resilient engagement with said peripheral surface,

said retainer including a holder for attaching said retainer to said receptacle so that said retainer extends generally above said valve element and across said cavity, a holding member attached to said holder and extending downwardly from said holder into engagement with substantially all of said bottom wall of said valve element so as to hold said bottom wall of said valve element in position against said ribs, and at least one vent opening extending through said holder,

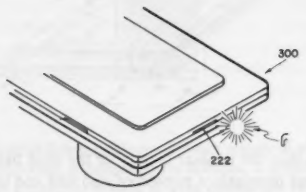
said holding member being shaped so as to permit said peripheral wall to be flexed inwardly away from said peripheral surface in response to internal gas pressure within said

housing so as to permit gas to move from around said valve element through said vent opening.

4,086,395
MULTI-SLIT SELF-SEALING IGNITION-ARRESTER BATTERY VENT

Joseph Irvin Heiser, Wyomissing Hills, and Edgar Martin Erb, Lancaster, both of Pa., assignors to General Battery Corporation, Reading, Pa.

Continuation-in-part of Ser. No. 593,546, Jul. 7, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,647
Int. Cl.² H01M 2/12
U.S. Cl. 429—88 **5 Claims**



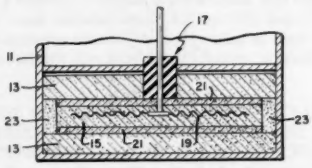
1. A battery vent for use on an electric storage battery to sealingly engage one or more openings of said battery and to vent battery gases to the atmosphere, comprising:

means for providing fluid communication between said battery and the atmosphere, said means comprising a plurality of slit means for preventing the transmission of ignition from the atmosphere through said slit means, each of said slit means being defined in at least one exterior surface of said vent, and having a width of about 0.004 to 0.005 inches.

4,086,396
ELECTROCHEMICAL CELL WITH POWDERED ELECTRICALLY INSULATIVE MATERIAL AS A SEPARATOR

James P. Mathers, Downers Grove; Theodore W. Olszanski, Justice, and Carl W. Boquist, Chicago, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 23, 1977, Ser. No. 771,131
Int. Cl.² H01M 4/36
U.S. Cl. 429—103 **9 Claims**



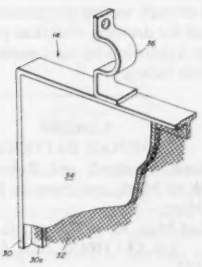
1. In a high-temperature secondary electrochemical cell having a positive electrode including a sulfide of a metal selected from the group consisting of iron sulfides, nickel sulfide, cobalt sulfide, and copper sulfide, a negative electrode including an alloy of lithium and an electrically insulated, porous separator between said electrodes, the improvement wherein said porous separator comprises a layer of discrete particles of electrically insulative and refractory material in mixture with particles of electrolytic salt composition that is molten at cell operating temperatures between 300° and 600° C, said electrically insulative and refractory materials being selected from the group consisting of boron nitride, magnesium oxide, calcium oxide, yttria, lithium aluminate, silicon nitride, aluminum nitride, and mixtures thereof.

5. An electrode structure adapted for use in a high-temperature secondary electrochemical cell opposite to a second electrode of opposite polarity; said electrode structure comprises a first layer of particulate active material including sulfide of a metal selected from the group consisting of iron sulfides, cobalt sulfide, nickel sulfide, and copper sulfide, and a solid electrolytic salt selected from the group consisting of alkali metal halides, the alkaline earth metal halides and mixtures thereof; and a second layer of refractory, electrically insulative, particles selected from the group consisting of boron nitride, magnesium oxide, calcium oxide, yttria, lithium aluminate, silicon nitride, aluminum nitride and mixtures thereof mixed with particles of said electrolytic salt, said first and second layers being compacted together to form an integral electrode structure with the electrolytic salt as a binder wherein the electrolytic salt is made molten at the operating temperature of the electrochemical cell to form a porous electrode reactant layer and an electrically insulative layer.

4,086,397
ELECTROCHEMICAL CELL AND CATHODE FOR SAME

Franz Goebel, Ashland, and Nikola Marincic, Winchester, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Jan. 31, 1977, Ser. No. 763,845
Int. Cl.² H01M 4/96
U.S. Cl. 429—105 **5 Claims**



1. A self-supporting cathode structure for use in an electrochemical cell comprising:

a rigid, electrically conductive, T-shaped frame member;

an electrically conductive generally planar substrate having a plurality of interstice-defining members and affixed about its periphery to the leg of the T-shaped frame member; and

an aggregate of discrete, porous carbon conglomerates impressed on the interstice-defining members of the substrate from opposite sides of the substrate and being in mutual physical and electrical contact through the interstices, a network of electrolyte-conducting channels extending throughout the resulting porous carbon structure;

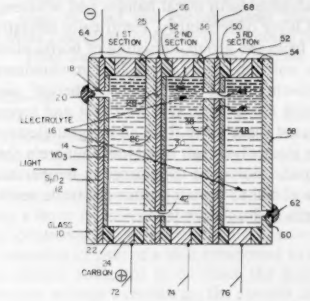
the interstice-defining member of the substrate electrically contacting the interior of the porous carbon structure throughout the porous carbon structure to function as a current collector for the cathode.

4,086,398

MULTI-COMPARTMENT PHOTOGALVANIC CELL

Donald K. Cartmell, Belvidere, and Horst Witzke, Princeton, both of N.J., assignors to Optel Corporation, Princeton, N.J. and Grumman Aerospace Corporation, Bethpage, N.Y., part interest to each

Filed Nov. 11, 1976, Ser. No. 740,874
Int. Cl.[2] H01M *6/30, 6/36*
U.S. Cl. 429—111 **11 Claims**



1. A multi-compartment photogalvanic cell having a plurality of aligned communicating sections, each comprising:

an electrode;

a counterelectrode spaced from the electrode;

an electrolyte means contained between the electrode and counterelectrode for enabling photogalvanic operation of the cell; and

means formed between the sections for permitting flow of the electrolyte between the sections;

said cell comprising:

transparent electrode means in an outermost section for receiving

light irradiation, and

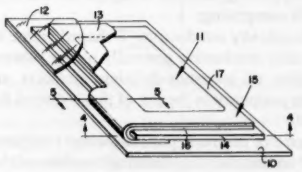
conductor means connected to the electrodes and counterelectrodes of each section for connecting said sections in parallel, and for drawing electrical power from the cell in response to irradiation by light received by said transparent electrode means.

4,086,399

LAMINAR BATTERIES

Albert L. Hyland, Wayland, and Robert G. Keene, Southborough, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 30, 1977, Ser. No. 782,836
Int. Cl.[2] H01M *2/00, 6/12*
U.S. Cl. 429—122 **2 Claims**



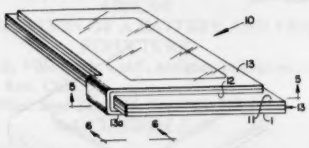
2. In a flat laminar battery of the kind in which one terminal has a flap that is folded over to permit access thereto on the same side of said battery as the other terminal, said flap being insulated from said other terminal by an insulating sheet comprising paper, the improvement wherein said flap covers only a minor portion of the length of the edge of the battery around which said flap is folded, thereby increasing the opportunity to inspect the battery for leakage and to allow the evaporation of any leakage that may occur.

4,086,400

CARRIER WEB FOR LAMINAR BATTERIES

Albert L. Hyland, Wayland, and Victor Mitchnick, Framingham, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 30, 1977, Ser. No. 782,837
Int. Cl.[2] H01M *2/00, 6/12*
U.S. Cl. 429—122 **6 Claims**



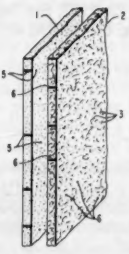
1. In a thin flat laminar battery of the kind having first and second end terminals, a portion of said first end terminal being folded around one edge of said battery to be accessible on the same side as said second end terminal, the improvement which comprises an insulating sheet between the superposed portions of the end terminals, said superposed portions consisting of said folded-around portion of said first end terminal and the confronting portion of said second end terminal, said insulating sheet consisting of a laminate comprising paper, a barrier layer of liquid impermeable insulating material on said paper, and a layer of adhesive on said insulating material and adhering said insulating sheet to said second end terminal.

4,086,401

ELECTRIC STORAGE BATTERY SEPARATOR

Erik G. Sundberg, Nol, Sweden, and Hans Steig, Soest, Germany, assignors to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Dec. 17, 1975, Ser. No. 641,756
Int. Cl.[2] H01M *2/14*
U.S. Cl. 429—145 **2 Claims**



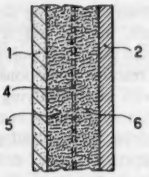
1. A composite, multi-layer separator effective to minimize formation of dendrites between electrodes of electric storage batteries, said separator comprising at least two thin, contacting, discrete, porous, non-laminated membranes comprising a material having a random distribution of pin holes capable of permitting formation of dendrites if used in a single layer as a separator at least one of said membranes being microporous and having an average pore size less than about 10 microns and said pin holes having a diameter larger than the desired pore size in said membranes,

each of said membranes singly being incapable of use as a separator but being capable of such use as a single layer separator in the absence of said pin holes.

4,086,402
LITHIUM ELECTRIC CELL

Georges Feuillade, Arpajon, France, assignor to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Mar. 15, 1977, Ser. No. 777,801
Claims priority, application France, Mar. 19, 1976, 76 0805
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—190 24 Claims



1. An electric cell comprising a lithium negative electrode, electrolytes including a non-aqueous solvent, a positive electrode made of a material which, during discharge, releases an anion capable of reacting with lithium to form a compound which is insoluble in the electrolyte and a membrane of an anionic exchanger material interposed in the electrolyte between the electrodes thereby defining a cathode compartment and an anode compartment, containing different electrolytes wherein the electrolyte in the cathode compartment includes at least one salt of predominantly anionic conductivity dissolved in the non-aqueous solvent and the electrolyte in the anode compartment includes at least one salt of predominantly cationic conductivity dissolved in the non-aqueous solvent.

4,086,403
ALKALI METAL/NIOBIUM TRISELENIDE CELL HAVING A DIOXOLANE-BASED ELECTROLYTE

M. Stanley Whittingham, Fanwood, and Gerald H. Newman, Westfield, both of N.J., assignors to Exxon Research & Engineering Co., Linden, N.J.

Filed Nov. 26, 1976, Ser. No. 744,973
Int. Cl.[2] H01M 6/14
U.S. Cl. 429—194 12 Claims

1. An electric current-producing cell, comprising:
(a) an alkali metal-containing anode;
(b) a cathode having as its cathode-active material, one or more trichalcogenides of the formula:

$$MZ_n$$

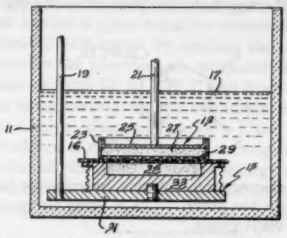
wherein M is niobium, wherein Z is selenium, and wherein n is a numerical value between about 2.5 and 3.5; and
(c) a non-aqueous electrolyte comprising at least one ionic alkali metal salt dissolved in a dioxolane solvent.

4,086,404
ELECTRODE INCLUDING POROUS PARTICLES WITH EMBEDDED ACTIVE MATERIAL FOR USE IN A SECONDARY ELECTROCHEMICAL CELL

Donald R. Vissers, Naperville; Paul A. Nelson, Wheaton; Thomas D. Kaun, Lisle, and Zygmunt Tomczuk, Palos Hills, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 652,696, Jan. 27, 1976, Pat. No. 4,048,715.
This application Apr. 7, 1977, Ser. No. 785,639
Int. Cl.[2] H01M 4/36
U.S. Cl. 429—220 6 Claims

1. An electrode for use in a secondary electrochemical cell comprising a porous substrate of electrically conductive material having a void volume impregnable by molten electrolyte and having solid particles including active material loosely distributed within the void volume of said substrate as separate and distinct particles, the improvement wherein said solid particles comprise porous carbonaceous particles of cured thermosetting material having embedded therein particles of electrode active material selected from the group of transition

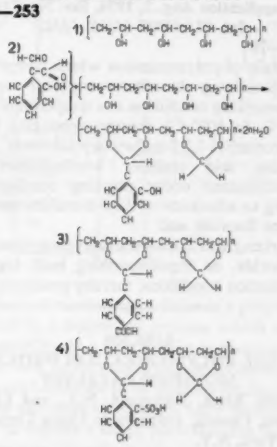


metal sulfides consisting of the sulfides of iron, cobalt, nickel and copper.

4,086,405
BATTERY CONTAINING AN ALKALINE ELECTROLYTE

Robert Gadessaud, Massy, France, assignor to Compagnie Generale d'Electricite S.A., Paris, France

Filed Dec. 18, 1972, Ser. No. 316,199
Claims priority, application France, Dec. 16, 1971, 71.45268; Aug. 4, 1972, 72.28255; Aug. 10, 1972, 72.28943; Feb. 18, 1972, 72.05561; Aug. 8, 1972, 72.28595; Aug. 10, 1972, 72.28944
Int. Cl.[2] H01M 2/14, 2/16
U.S. Cl. 429—253 4 Claims



1. An alkaline battery having a zinc electrode or cadmium-nickel electrodes, said battery containing within a container an electrolyte, a negative electrode and a positive electrode separated by a separator consisting of a membrane permeable to said electrolyte and impermeable to the ions emitted by said negative electrode and also to gaseous oxygen, thus creating two compartments communicating solely by way of this membrane, said battery being characterized in that the separator comprises a partially reticulated polyvinyl acetal produced by the action of dimethylolurea and an aromatic aldehyde comprising a hydroxyl radical on polyvinyl alcohol.

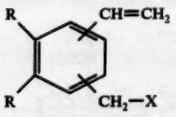
4,086,406
COUPLING LITHIUM-INITIATED POLYMER WITH A VINYLHALOMETHYLARENE

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 22, 1975, Ser. No. 642,881
Int. Cl.[2] C08F 8/04, 8/26
U.S. Cl. 526—25 10 Claims

1. A process for producing polymer of at least one monomer selected from the group consisting of conjugated dienes and vinylarenes by contacting said at least one monomer under polymerization conditions with an organolithium, the improvement comprising:

introducing at the conclusion of the resulting polymerization 0.6 to 1.4 equivalents based on the amount of metal in the polymer of a vinylhalomethylarene having the formula



wherein X is selected from chlorine, bromine, or iodine, with the halogenated alkyl group $—CH_2X$ being alternatively meta or para to the vinyl group,

the R's being the same or different, and being selected from the group consisting of hydrogen, methyl and ethyl or being linked together to comprise a 4-carbon atom chain, and

recovering the resulting coupled polymer.

4,086,407

FLUORO COMPOUND PREPARATION

George B. Fozzard, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 330,736, Feb. 8, 1973, Pat. No. 3,996,299. This application Aug. 2, 1976, Ser. No. 711,031

Int. Cl.² C08F *14/18, 14/22*

U.S. Cl. 526—75 **4 Claims**

1. The process of polymerization which comprises:

(a) cyclodimerizing hexafluoropropylene and ethylene under dimerizing conditions at a temperature in the range of 200° C. to 600° C., thereby producing the codimer 1-trifluoromethyl-1,2,2-trifluorocyclobutane,

(b) cracking said codimer 1-trifluoromethyl-1,2,2-trifluorocyclobutane under cracking conditions, thereby producing an admixture of 2,3,3-tetrafluoropropylene and vinylidene fluoride, and

(c) polymerizing said 2,3,3-tetrafluoropropylene, said vinylidene fluoride, or copolymerizing both together under polymerization conditions, thereby producing a polymer.

4,086,408

ETHYLENE POLYMERIZATION WITH SILANE MODIFIED CATALYST

Frederick John Karol, Bellemead, N.J., and Chi-Sung Wu, Beaconsfield, Canada, assignors to Union Carbide Corporation, New York, N.Y.

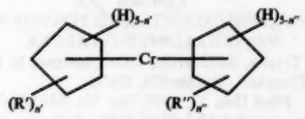
Division of Ser. No. 426,559, Dec. 20, 1973, which is a continuation-in-part of Ser. No. 156,187, Jun. 24, 1971, abandoned. This application May 19, 1976, Ser. No. 687,943

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—130 **20 Claims**

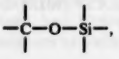
1. In a process for polymerizing a monomer charge comprising ethylene by contacting said charge with activated inorganic oxide supported bis(cyclopentadienyl) chromium [II] catalyst

wherein said inorganic oxide is selected from the group consisting of silica, alumina, thoria, zirconia and mixtures thereof, and the bis(cyclopentadienyl) chromium [II] compound has the structure



wherein n' and n'' are each integers of 0 to 5, inclusive, and R′ and R″ are each C_1 to C_{20}, inclusive, hydrocarbon radicals,

the improvement which comprises modifying said catalyst prior to said contact with said monomer charge by contacting said catalyst with, per mol of the organochromium compound, 0.01 to 20 mols of at least one modifying compound having in its structure at least one moiety of the formula



said modifying compound being devoid of OH, SH, NH_2, COOH, halogen, alkoxy and aryloxy radicals in such amounts as would poison the polymerization system under the prevailing reaction conditions, and

said modifying with said modifying compound providing a modified catalyst with which, in comparison to the use of the unmodified catalyst in said polymerization process, polymers of improved impact strength are prepared.

4,086,409

ETHYLENE POLYMERIZATION WITH SILOXANE MODIFIED CATALYST

Frederick John Karol, Bellemead, N.J., and Chi-Sung Wu, Beaconsfield, Canada, assignors to Union Carbide Corporation, New York, N.Y.

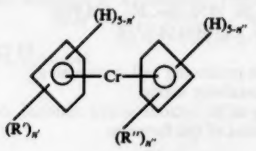
Division of Ser. No. 426,559, Dec. 20, 1973, which is a continuation-in-part of Ser. No. 156,187, Jun. 24, 1971, abandoned. This application May 19, 1976, Ser. No. 687,944

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—130 **25 Claims**

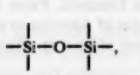
1. In a process for polymerizing a monomer charge comprising ethylene by contacting said charge with activated inorganic oxide supported bis(cyclopentadienyl) chromium [II] catalyst

wherein said inorganic oxide is selected from the group consisting of silica, alumina, thoria, zirconia and mixtures thereof, and the bis(cyclopentadienyl) chromium [II] compound has the structure



wherein n' and n'' are each integers of 0 to 5, inclusive, and R′ and R″ are each C_1 to C_{20}, inclusive, hydrocarbon radicals,

the improvement which comprises modifying said catalyst prior to said contact with said monomer charge by contacting said catalyst with, per mol of the organochromium compound, 0.01 to 20 mols of at least one modifying compound having in its structure at least one moiety of the formula



said modifying compound being devoid of OH, SH, NH_2, COOH, halogen, alkoxy and aryloxy radicals in such amounts as would poison the polymerization system under the prevailing reaction conditions, and

said modifying with said modifying compound providing a modified catalyst with which, in comparison to the use of the unmodified catalyst in said polymerization process, polymers of improved impact strength are prepared.

4,086,410

THERMOPLASTIC MOLDING COMPOSITION COMPRISING A TERPOLYMER OF α-METHYLSTYRENE, METHYL METHACRYLATE AND N-VINYL-2-PYRROLIDONE

Il H. Song, Lombard, Ill., assignor to The Richardson Company, Des Plaines, Ill.

Filed May 10, 1976, Ser. No. 684,792
Int. Cl.[2] C08F 26/10
U.S. Cl. 526—264 6 Claims

1. A transparent, high heat thermoplastic molding composition having improved melt flow characteristics, comprising a terpolymer having a weight ratio of from about 20 to 50 parts α-methylstyrene, about 79 to 40 parts methyl methacrylate, and about 1 to 10 parts N-vinyl-2-pyrrolidone.

4,086,411

METHOD OF REMOVING VINYL CHLORIDE MONOMER FROM A VINYL CHLORIDE POLYMER

Mineo Nagano, and Koji Tanaka, both of Yokkaichi, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Dec. 9, 1975, Ser. No. 639,051
Claims priority, application Japan, Dec. 13, 1974, 49-142449
Int. Cl.[2] C08F 6/00
U.S. Cl. 528—480 4 Claims

1. A method of removing vinyl chloride monomer which remains in a homopolymers or copolymers of vinyl chloride, which comprises irradiating said polymer of vinyl chloride with high energy electromagnetic radiation, having a frequency of 10–100 MHz, to excite said vinyl chloride monomer in said polymer thereby removing said vinyl chloride monomer.

4,086,412

METHOD FOR REMOVING A VINYL HALIDE FROM POLYVINYL HALIDE-CONTAINING SLURRY

Gary R. Johnson, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Jan. 19, 1976, Ser. No. 650,207
Int. Cl.[2] C08F 6/24, 6/16, 6/10
U.S. Cl. 528—499 3 Claims

1. A process for removing unreacted vinyl halide from a water-polyvinyl halide slurry wherein the process consists essentially of

(a) adding water-polyvinyl halide slurry, containing unreacted vinyl halide, to a column extractor vessel at a position near one end of said vessel

(b) adding hot water, at a temperature of about 65° to about 121° C., to said column extractor vessel at a position near the other end of said vessel

(c) removing hot water containing unreacted vinyl halide from the column extractor vessel at a position near the end of the vessel opposite to the end of entry of said hot water,

(d) removing polyvinyl halide from the column extractor vessel at a position near the end of the vessel opposite to the end of entry of said polyvinyl halide,

(e) said process being characterized further in that the amount of hot water is at least 1 volume per unit volume of water-polyvinyl halide slurry.

4,086,413

PURIFICATION OF COPOLYMERS CONTAINING CROTONIC ACID

Joachim Stedefeder, Lampertheim; Ingo H. Dorn, Dannstadt-Schauernheim; Horst Kuhn, Otterstadt; Walter Kastenhuber, Hoeningen, and Wolfgang Linke, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed May 2, 1977, Ser. No. 792,729
Claims priority, application Germany, May 20, 1976, 2622463
Int. Cl.[2] C08J 11/00
U.S. Cl. 528—499 2 Claims

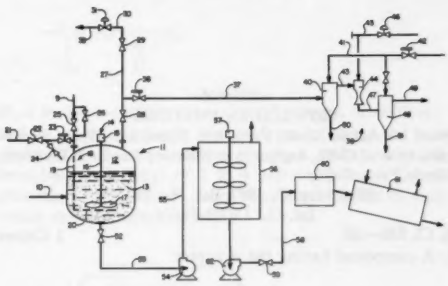
1. A process for purifying copolymers, containing crotonic acid as copolymerized monomer units, to remove unconverted monomeric crotonic acid and concomitant odorous materials, the copolymers being in the form of particles suspended in water and having a glass transition temperature of <30° C when saturated with water, by washing the copolymers with water, wherein the polymers are extracted with fully desalinated water at from 50° to 120° C and from 1 to 4 bars, the extraction being carried out in a cylindrical extraction vessel which has a height/diameter ratio of >1, the water of extraction is introduced at the bottom and removed at the top and the system is stirred, the ratio of the flow energy to the energy of stirring being from 1:4 to 4:1 and the total energy acting on the system being such that the particles just remain suspended.

4,086,414

STEAM STRIPPING POLYVINYL CHLORIDE RESINS

Edwin D. Hornbaker; Adam Nugent, Jr., and Cecil P. Loechelt, all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 498,546, Aug. 19, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,428
Int. Cl.[2] C08F 6/10
U.S. Cl. 528—500 8 Claims



1. In the method of treating particles of a polyvinyl chloride resin prepared by a suspension process, which resin particles have a susceptibility to a degradation in thermal stability and an increase in bulk density upon prolonged heating and where the particles are contained in an aqueous medium wherein the resin particles and aqueous medium have been subjected to a flashing step to remove a major portion of the unreacted vinyl chloride monomer therefrom, the improvement for further reducing the vinyl chloride monomer content of the resin particles comprising:

a. placing the resin particles and aqueous medium alone in a closed vessel and agitating the resin particles in the aqueous medium;

b. directly heating the aqueous suspension of the resin particles by injecting steam herein for a period of time between about 5 minutes and 45 minutes to raise the temperature of the suspension in a range of from about 180° F to about 240° F while simultaneously removing from the vessel a vapor phase containing vinyl chloride monomer and the aqueous medium;

c. terminating the heating step;

d. cooling the suspension to a temperature of about 120° F to about 170° F in less than about 1 hour by applying a sufficient vacuum to the vessel to cause vaporization of a portion of said aqueous medium to remove at least about 80% of the vinyl chloride monomer remaining in the resin particles after the completion of step (b); and

e. whereby treated polyvinyl chloride resin particles are produced having a vinyl chloride monomer content less than about 340 ppm (dry resin basis) and a thermal stability and bulk density not significantly different from the resin particles prior to treating.

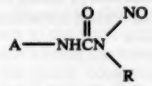
4,086,415

NITROSOUREA DERIVATIVES OF GLYCOSIDES

Tetsuo Suami, No. 5-8, 3-chome, Nakamachi, Musashino-shi, Tokyo, Japan; Tomoya Machinami, Shiraoka, and Takashi Hisamatsu, Yokohama, both of Japan, assignors to Tetsuo Suami, Musashino, Japan

Filed Jul. 30, 1975, Ser. No. 600,206
Claims priority, application Japan, Aug. 8, 1974, 49-90266
Int. Cl.[2] C07H *11/02*
U.S. Cl. 536—22 7 Claims

1. Nitrosourea of the formula:



wherein A represents a glycosyl selected from the group consisting of maltosyl, glucosyl, mannosyl, galactosyl, xylosyl, and lactosyl and R represents a halo-substituted lower alkyl.

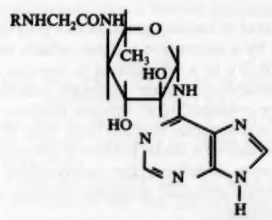
4,086,416

SEPTACIDIN ANALOGS

Edward M. Acton, Menlo Park, and Kenneth J. Ryan, Sunnyvale, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed May 17, 1977, Ser. No. 797,591
Int. Cl.[2] C07H *19/16*
U.S. Cl. 536—24 3 Claims

1. A compound having the structure



where R is an alkanoyl radical of from 12 to 16 carbon atoms.

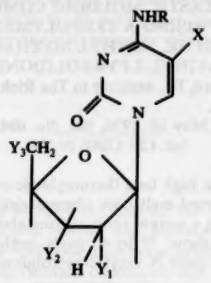
4,086,417

CYTIDINE NUCLEOTIDE DERIVATIVES

Torao Ishida; Minoru Akiyama, both of Fuji; Yoshio Sakurai, Mitaka, and Shigeru Tsukagoshi, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Oct. 15, 1975, Ser. No. 622,794
Claims priority, application Japan, Oct. 15, 1974, 49-117664; Nov. 27, 1974, 49-135574
Int. Cl.[2] C07H *19/10*
U.S. Cl. 536—29 25 Claims

1. A nucleotide derivative represented by the general formula



wherein R represents an acyl group having 14 to 22 carbon atoms and having an aliphatic acyl moiety; X represents a hydrogen atom, a halogen atom, an alkyl group having 1 to 4 carbon atoms, or a trifluoromethyl group; and one of Y_1 and Y_3 or both Y_1 and Y_3, or both Y_2 and Y_3 in case of ribosyl; and one of Y_1 and Y_3, or both Y_1 and Y_2 or both Y_2 and Y_3 in case of arabinosyl, represent a phosphate, a pyrophosphate, a triphosphate, or a salt thereof, the balance of Y_1, Y_2 and Y_3 representing a hydroxyl group, wherein said salt is a pharmaceutically acceptable salt.

4,086,418

PROCESS FOR PRODUCING A REGENERATED HOLLOW CELLULOSIC FIBER

Albin Frank Turbak, Convent Station; Richard Benjamin Hammer, Morris Plains; Norman A. Portnoy, Hopatcong, all of N.J., and Arthur C. West, St. Paul, Minn., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,134
Int. Cl.[2] C08B *16/00*
U.S. Cl. 536—30 8 Claims

1. A process for producing a regenerated hollow cellulosic fiber comprising nitrosating cellulose with a nitrosating agent selected from the group consisting of an oxide of nitrogen and nitrosyl chloride and dissolving the cellulose in an aprotic solvent selected from the group consisting of a dialkylacylamide and dimethylsulfoxide and regenerating the dissolved cellulose by contacting the cellulosic solution with a regenerant, said regenerant being n-octanol where the solvent is a dialkylacylamide and n-hexanol where the solvent is dimethylsulfoxide.

4,086,419

PREPARATION OF STARCH SULFATE ESTERS

Martin M. Tessler, Edison, N.J., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Feb. 24, 1976, Ser. No. 660,911
Int. Cl.[2] C08B *31/02*
U.S. Cl. 536—107 8 Claims

1. A process for preparing sulfate esters of starch comprising the steps of:

a. reacting a starch having free reactive hydroxyl groups

with a fluorosulfate reagent selected from the group consisting of ammonium fluorosulfate and alkali metal fluorosulfates, wherein the amount of the reagent employed is 1 to 125%, based on the weight of dry starch, and the reaction is carried out in an aqueous medium at a pH of 11.2 to 13.0 and at a temperature of about 30° to 90° C. for a period of from 0.2 to 24 hours; and

b. isolating the resultant starch sulfate ester.

4,086,420

THIOPRENE OR FURAN DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Genichi Tsuchihashi, Tama, and Katsuyuki Ogura, Sagamihara, both of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

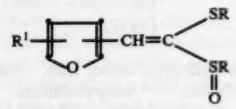
Division of Ser. No. 651,112, Jan. 21, 1976, Pat. No. 4,051,151. This application Apr. 22, 1977, Ser. No. 790,132

Claims priority, application Japan, Jan. 23, 1975, 50-9297; Jan. 27, 1975, 50-10520; Feb. 3, 1975, 50-13389; Nov. 25, 1975, 50-140294

Int. Cl.² C07D *307/26*

U.S. Cl. 542—413 **6 Claims**

1. A compound of the formula



wherein R^1 represents a member selected from the group of hydrogen and alkyl and R represents a member selected from the group of (1) alkyl, (2) substituted alkyl wherein the substituent is halogen, hydroxy or alkoxy, (3) phenyl, and (4) substituted phenyl wherein the substituent is alkyl, alkoxy, aryl, nitro or halogen.

4,086,421

SUBSTITUTED ISOXAZOLO PYRIDINONES

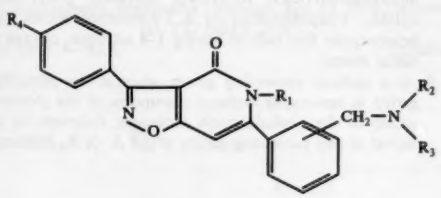
Jeffrey Nadelson, Denville, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 705,702, Jul. 15, 1976, Pat. No. 4,049,813. This application Jun. 13, 1977, Ser. No. 805,881

Int. Cl.² C07D *491/04*

U.S. Cl. 544—127 **4 Claims**

1. A compound of the formula



where

R_1 represents straight chain lower alkyl, and

R_2 and R_3 together with N represent

where

X is O or N—CH_3, and

R_4 is hydrogen, halo having an atomic weight of about 19 to 36 or lower alkoxy, or a pharmaceutically acceptable salt thereof.

4,086,422

CARBAMOYLALKYLUREIDO CEPHALOSPORINS

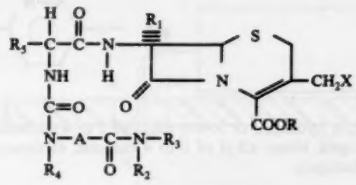
Hermann Breuer, and Uwe Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Aug. 16, 1976, Ser. No. 714,420

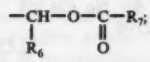
Int. Cl.² C07D *501/38*

U.S. Cl. 544—21 **19 Claims**

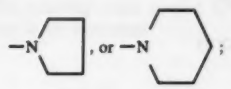
1. A compound of the formula



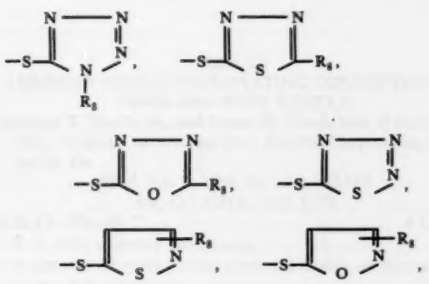
wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, diphenyl-lower alkyl, tri(lower alkyl)silyl, trihaloethyl, an alkali metal ion, an alkaline earth metal ion, dibenzylamine, N,N-dibenzylethylenediamine, methylamine, triethylamine, N-ethylpiperidine, or



R_1 is in the α-configuration and is hydrogen or methoxy; R_2 and R_3 are independently selected from hydrogen and straight chain alkyl of 1 to 4 carbons, or R_2 is hydrogen and R_3 is branched chain alkyl of 3 to 4 carbons, phenyl, benzyl or phenethyl, or R_2 and R_3 taken together with the N atom to which they are attached form



R_4 is hydrogen or lower alkyl; A is straight or branched chain alkylene of 1 to 6 carbons; R_5 is hydrogen, lower alkyl, cycloalkyl of 3 to 7 carbons, cycloalkenyl of 3 to 7 carbons, cycloalkadienyl of 6 or 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, and hydroxy, or a monosubstituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl, and 4-pyridyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl of 1 to 4 carbons; R_6 is hydrogen or lower alkyl; R_7 is lower alkyl; and X is a heterothio group selected from the group consisting of



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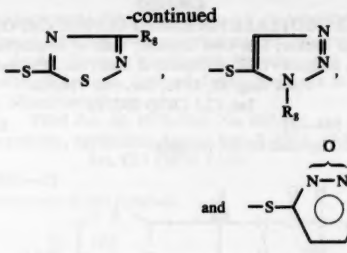


wherein R_8 is hydrogen or lower alkyl of 1 to 4 carbons and R_9 is hydrogen, lower alkyl of 1 to 4 carbons, methoxy, hydroxy, or halogen.

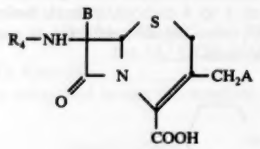
4,086,423

PROCESS FOR CEPHEM SYNTHESIS

Raymond A. Firestone, Fanwood; Ronald W. Ratcliffe, N. Plainfield, and Burton G. Christensen, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 406,000, Oct. 12, 1973, abandoned.
This application Oct. 21, 1975, Ser. No. 624,369
Int. Cl.[2] C07D *501/08*
U.S. Cl. 544—21 **2 Claims**

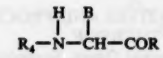
1. A process of producing useful cephalosporin antibiotics of the formula:



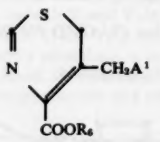
wherein B is H, CH_3, OCH_3 or SR' wherein R' is lower alkyl of 1–6 carbon atoms or phenyl;

R_4 is the acyl group of a carboxylic acylating agent capable of acylating the 7-amino group of a cephalosporin;

A is hydrogen, azido, halo, cyano, pyridinium, methylpyridinium, halopyridinium, carbamoylpyridiminium, N-hydroxymethylcarbamoylpyridinium, (N-carbomethoxycarbamoyl)pyridinium, (N-cyanocarbamoyl)pyridinium, (carboxymethyl)pyridinium, (hydroxymethyl)pyridinium, (trifluoromethyl)pyridinium, quinolinium, picolinium, lutidinium, hydroxy, carbamoyloxy, N-loweralkyl carbamoyloxy, N,N-di-loweralkyl carbamoyloxy, a heterocyclic tertiary amine wherein the heterocycle is 5- or 6-membered and contains one or more nitrogen, oxygen or sulfur atoms, amino, aminomethyl, acetamidomethyl, carbamoylaminomethyl, 5-cyano-triazol-1-ylmethyl, 4-methoxycarbonyltriazol-1-ylmethyl, mercapto, alkylthio of 1–6 carbon atoms, lower alkanoyloxy, benzoyloxy, (p-chlorobenzoyl)oxy, (p-methylbenzoyl)oxy, furoyloxy, tosyloxy, 1-naphthoyloxy, or a 5-membered monocyclic heterocyclic thio radical having 1–4 nitrogen, oxygen or sulfur atoms; which comprises the cycloaddition of a glycine derivative of the formula



wherein R_4 and B have the same meaning as above and R is OH, halogen, O—$COOR_6$, or trifluoromethanesulfonate, CN, N_3 or $OCOCF_3$; with a thiazine derivative of the formula:



wherein A' is hydrogen, azido, halo, cyano, pyridinium, methylpyridinium, halopyridinium, carbamoylpyridinium, N-hydroxymethylcarbamoylpyridinium, (N-carbomethoxycarbamoyl)pyridinium, (N-cyanocarbamoyl)pyridinium, (carboxymethyl)pyridinium, (hydroxymethyl)pyridinium, (trifluoromethyl)pyridinium, quinolinium, picolinium, lutidinium, protected hydroxy wherein the protecting group is removable by mild aqueous hydrolysis or by hydrogenation, carbamoyloxy, N-loweralkyl carbamoyloxy, N,N-di- loweralkyl carbamoyloxy, a heterocyclic tertiary amine wherein the heterocycle is 5-or 6-membered and contains one or more nitrogen, oxygen or sulfur atoms, protected amino, aminomethyl, acetamidomethyl, carbamoylaminomethyl, N,N-dimethylaminomethyl, N-(2-chloroethyl)aminomethyl, 5-cyano-triazol-1-ylmethyl, 4-methoxycarbamoyltriazol-1-ylmethyl, protected mercapto wherein the protecting group is removable by mild aqueous hydrolysis or by hydrogenation, alkylthio of 1–6 carbon atoms, lower alkanoyloxy, benzoyloxy, (p-chlorobenzoyl)oxy, (p-methylbenzoyl)oxy, furoyloxy, tosyloxy, p-tolylsulfonylthio, 1-naphthoyloxy or a 5-membered monocyclic heterocyclic thio radical having 1–4 nitrogen, oxygen or sulfur atoms;

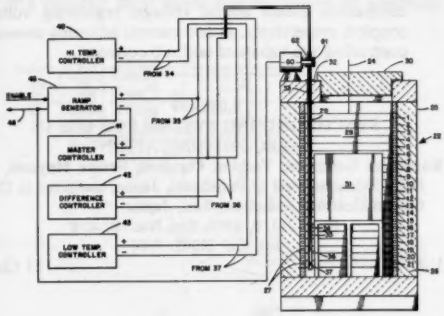
R_6 is a carboxy protecting group wherein the protecting group is removable without disruption of the β-lactam group of the cephalosporin molecule; followed by removal of any protecting group at the A' or R_6 position.

4,086,424

DYNAMIC GRADIENT FURNACE AND METHOD

Robert H. Mellen, Sr., P.O. Box 535, New London, N.H. 03257

Filed Mar. 31, 1977, Ser. No. 783,269
Int. Cl.[2] B01J *17/08*
U.S. Cl. 13—24 10 Claims



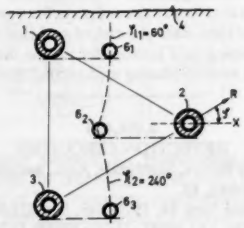
1. A dynamic gradient furnace in which the isotherm is movable under control comprising:
(a) A furnace enclosing a heating chamber;
(b) a plurality of individually controllable heating zones encircling said chamber in stacked sequence;
(c) a plurality of temperature control means each connected to control at least one of said zones;
(d) transfer means for transferring said control means between zones; and
(e) ramp function means for effecting a change in temperature control of at least one of said temperature control means at a predetermined rate after transfer of said control means between zones.

4,086,425

THREE-PHASE CABLE SYSTEM WITH COMPENSATION OF LONGITUDINAL VOLTAGES INDUCED IN ACCOMPANYING RETURN-FLOW PIPES FOR COOLING WATER

Heinrich Brakelmann, Kamp-Kintfort, Germany, assignor to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Filed Apr. 13, 1977, Ser. No. 787,071
Claims priority, application Germany, Apr. 14, 1976, 2616368
Int. Cl.[2] H01B *7/34*
U.S. Cl. 174—15 C 7 Claims



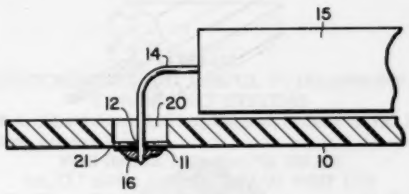
1. A three-phase cable system comprising, in combination, three single-conductor cables of the internally water-cooled type; and three return-flow pipes each associated with a respective one of the three cables for returning cooling water, the three return-flow pips being so disposed relative to the three cables that substantially no net longitudinal voltages are induced in the three return-flow pipes.

4,086,426

STRESS RELIEVED PRINTED WIRING BOARD

Thomas A. Knappenberger, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jul. 1, 1976, Ser. No. 701,833
Int. Cl.[2] H05K *1/08*
U.S. Cl. 174—68.5 4 Claims



1. A stress relieved printed wiring board comprising:
(a) a board of dielectric material with two major surfaces;
(b) printed electrical circuitry affixed to one major surface of said board with at least one mounting pad formed therein for connecting a lead of a component thereto;
(c) said board having defined therethrough a hole approximately centered in said mounting pad and having a diameter slightly greater than the diameter of a connecting lead to be received therein; and
(d) said board further having defined therein a second hole substantially coaxial with said first hole with a cross-sectional area larger than the area of said mounting pad bearing against the one major surface, the second hole extending partially through said board from the major surface opposite said mounting pad toward the major surface having said mounting pad thereon to reduce the thickness of said board contiguous with said mounting pad for relieving stress caused by thermal cycling and dynamic environments.

4,086,427

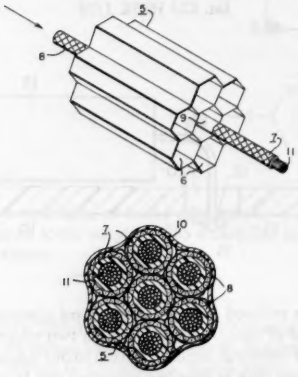
COMMON SHIELD-TERMINATING CONNECTION IN SHIELDED WIRE BUNDLE

Anthony T. Nasuta, Jr., and James W. Walsh, both of Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 8, 1976, Ser. No. 693,985
Int. Cl.[2] H01R *5/02, 5/10*
U.S. Cl. 174—88 C 6 Claims

1. A wire assembly comprising:
a plurality of wires having electrical shields on their exteriors, and

a conductive honeycomb member having cells through which said wires pass,



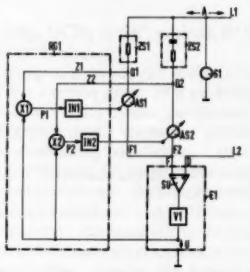
said honeycomb member being compacted around said electrical shields in electrical contact therewith.

4,086,428

CIRCUIT ARRANGEMENT FOR THE AUTOMATIC ADJUSTMENT OF A TWO-WIRE FULL DUPLEX DATA TRANSMISSION SYSTEM

Adolf Haass, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 4, 1977, Ser. No. 793,532
Claims priority, application Germany, May 4, 1976, 2619712
Int. Cl.² H04L *5/14*
U.S. Cl. 178—60 **4 Claims**



1. In a full duplex data transmission system having subscriber stations interconnected by two wire lines, each subscriber station having a transmitter and a receiver, a circuit arrangement in each said subscriber station for automatically adjusting the value of current conducted from the transmitter in a given station to receive therein relative to the value of a received current transmitted from another of said stations, the circuit arrangement comprising:

balancing circuit means coupling current from said transmitter in the given station to the receiver therein, said balancing circuit comprising a plurality of branch circuits for dividing said transmitter current into a plurality of sub-currents, said sub-currents being recombined prior to coupling to said receiver, each said branch circuit being a series combination of a voltage responsive current adjusting means and a timing circuit,

comparison means for receiving said transmitter current as supplied from said balancing circuit means and said received current and for producing an output voltage having a value proportional to the difference between the values of said transmitter current and said received current, and

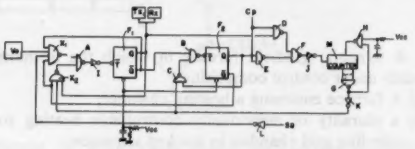
regulating circuit means for producing, responsive to said comparison means output voltage, regulating voltages coupled, respectively, to said current adjusting means for controlling the values of said sub-currents.

4,086,429

SYNCHRONIZING SYSTEM FOR USE IN TELECOMMUNICATION

Katsutaka Kotezawa; Toshimi Onodera; Setsuo Hayashi, and Fujio Shimanuki, all of Funabashi, Japan, assignors to Chiba Communications Industries, Inc., Japan

Filed Jul. 6, 1976, Ser. No. 702,455
Int. Cl.² H04L *7/00*
U.S. Cl. 178—69.1 **11 Claims**



11. In a synchronizing circuit for use in a time division telecommunication system having a calling station and a called station, each station having a transmitter means and receiver means, said synchronizing circuit comprising first detecting means for providing a first control signal indicating the receipt of an electrical signal representing an aural signal from said called station, second detecting means for providing a second control signal indicating the transmission of an electrical signal representing an aural signal by said calling station, bistable means for controlling the operation of said transmitter means and said receiver means, said bistable means being normally maintained in a first state for disabling said transmitter means and enabling said receiver means, enabling means responsive to said second control signal and in the absence of said first control signal to operate said bistable means to a second state for enabling said transmitter means and simultaneously disabling said receiver means, timer means responsive to said bistable means being operated to said second state for controlling said enabling means to cause said bistable means to be operated from said second state to said first state at the end of a first predetermined period of time for disabling said transmitter means and enabling said receiver means, and inhibit means responsive to said bistable means and said timer means for inhibiting said enabling means to prevent said bistable means from being operated to said second state for a second predetermined period of time after the end of said first period of time, thereby maintaining said transmitter means disabled and said receiver means enabled during said second period of time.

4,086,430

DETECTION CIRCUITRY

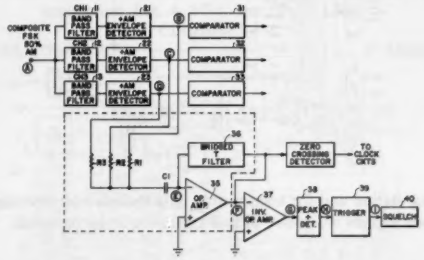
Kenneth Harvey Brown, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 14, 1975, Ser. No. 631,807
Int. Cl.² H04L *15/24;* H04B *1/10*
U.S. Cl. 178—88 **3 Claims**

1. Detention circuitry for detecting an incoming composite signal of the type, such as Frequency Shift Keying 50% amplitude modulation (FSK 50% AM) or FSK-PCM (pulse code modulation) return-to-zero signal, comprising a plurality of channels for separating the composite signal and forming amplitude envelope signals the corresponding constituent signals forming the composite signal,

means connected to said plurality of channels for summing and differentiating the envelope signals and filtering the summed and differentiated envelope signals into a bandpass filtered signal that is a composite of an AC and differentiated DC components,

output means for generating an output signal upon detection of a required input signal thereto having an amplitude



which exceeds a predetermined value and a predetermind polarity, and means interposed between said output means and said summing, differentiating and filtering means for setting the polarity of the DC component of the bandpass filtered signal so that the DC component is the same polarity as that of the required input signal of said output means for hastening the speed of the output means in sensing the start of the incoming composite signal.

4,086,431
COMPRESSION SYSTEM

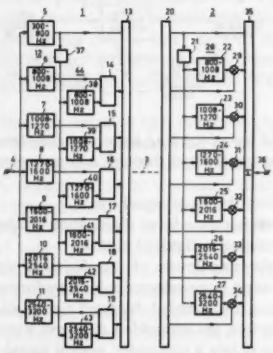
Nico Valentinus Franssen; Karel Elbert Kuijk, both of Eindhoven, and Johannes Willem Siebelink, Arnhem, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 5, 1977, Ser. No. 757,297

Claims priority, application Netherlands, Jan. 30, 1976, 7600932

Int. Cl.² G10L *1/00*

U.S. Cl. 179—1 SA **6 Claims**



1. A transmitter vocoder for transmitting speech signals comprising, means for receiving and dividing the speech signals into a band of low-frequency components and a band of high-frequency components, means for deriving from the band of high-frequency components of the speech signal a plurality of control signals with reduced bandwidth which are representative of a corresponding number of sub-bands of the band of high-frequency components of the speech signal, means for producing corresponding bands of high frequency components from the band of low frequency components, and means for transmitting the band of low-frequency components of the speech signal and the control signals, the means for deriving the control signals with reduced bandwidth from each sub-band comprising a device means for determining the ratio between the energy in the sub-band of the band of high-frequency components of the speech signal and the energy in the corresponding sub-band of said band of high-frequency components which is produced from the band of low-frequency components of the speech signal.

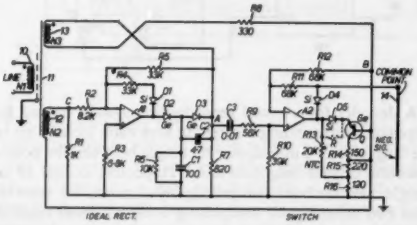
4,086,432
SWITCHING CIRCUIT USEFUL IN TELEPHONE CONFERENCE SYSTEMS

Ralph Archibald Jones, London, England, assignor to The Post Office, London, England

Filed Dec. 13, 1976, Ser. No. 749,780

Int. Cl.² H04M *3/56*; H02M *7/00*; H03F *1/36*

U.S. Cl. 179—1 CN **11 Claims**



1. A switching circuit including an inverting d.c. amplifier with first and second resistive negative feedback paths having first and second resistors connected in series respectively with first and second unilaterally conducting devices connected in opposite polarity to the output of the amplifier, a first signal source and a second signal utilisation circuit connected to the electrode of the first unilaterally conducting device remote from the output of the amplifier and a second signal source and a first signal utilisation circuit connected to the electrode of the second unilaterally conducting device remote from the output of the amplifier, whereby only an input signal of polarity such as to cause the first unilaterally conducting device not to conduct can be applied from the first signal source to the first signal utilisation circuit and only an input signal of polarity such as to cause the second unilaterally conducting device not to conduct can be applied from the second signal source to the second signal utilisation circuit.

5. A telephone conference amplifier having a plurality of channels, each channel including means for receiving an input signal and producing therefrom a unidirectional polarity signal, switch means including an inverting d.c. amplifier with first and second resistive negative feedback paths having first and second resistors connected in series respectively with first and second unilaterally conducting devices connected in opposite polarity to the output of the amplifier, means for applying the unidirectional polarity signal from the producing means to the electrode of the first unilaterally conducting device remote from the output of the amplifier, the polarity of the first unilaterally conducting device being such that the unidirectional polarity signal does not cause it to conduct, means connecting the electrode of the second unilaterally conducting device remote from the output of the amplifier to a point common to all of the channels and means connected to a point on the first resistive negative feedback path to derive therefrom, in response to a unidirectional polarity signal from the common point, a unidirectional polarity signal of the same polarity as that applied to the electrode of the first unilaterally conducting device and to produce therefrom a symmetrically polarised output signal.

4,086,433
SOUND REPRODUCTION SYSTEM WITH NON-SQUARE LOUDSPEAKER LAY-OUT

Michael Anthony Gerzon, Oxford, England, assignor to National Research Development Corporation, London, England

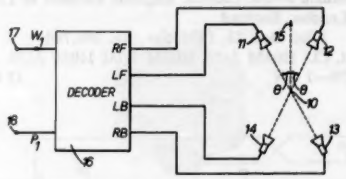
Continuation of Ser. No. 560,865, Mar. 21, 1975, Pat. No. 3,997,725. This application Nov. 4, 1976, Ser. No. 738,734

Claims priority, application United Kingdom, Mar. 26, 1974, 13292/74

The portion of the term of this patent subsequent to Dec. 14, 1993, has been disclaimed.

Int. Cl.[2] H04R *5/00*

U.S. Cl. 179—1 GQ **8 Claims**



1. A decoder for a sound reproduction system having four loudspeakers surrounding a listening area each located on one of the diagonals of a non-square rectangle between the point of intersection of said diagonals and a respective corner of said rectangle, said decoder comprising input means for receiving at least two input signals comprising complex linear combinations of pressure signal components and velocity signal components representative of the pressure and of velocity at a listening position and signal processing means for producing first and second difference signal components from said velocity signal components, said first difference signal components being dependent on the required difference in signal strength between the sum of the signals for a first adjacent pair of said loudspeakers and the sum of the signals for a second adjacent pair comprising the other two loudspeakers and said second difference signal components being dependent on the required difference in signal strength between the sum of the signals for a third adjacent pair of loudspeakers comprising one loudspeaker from each of said first and second adjacent pairs and the sum of the signals for a fourth adjacent pair of loudspeakers comprising the other loudspeaker from each of said first and second adjacent pairs of loudspeakers, said decoder further comprising layout control means for applying first and second gains to said first and second difference signal components, the ratio between the first and second gains being substantially equal to the ratio between the sine of half the angle between the diagonals on which said first pair of loudspeakers are located and the sine of half the angle between the diagonals on which said third pair of loudspeakers are located, and output means responsive to said layout control means and said pressure signal components for producing a responsive output signal for each loudspeaker.

4,086,434
REMOTE CONDITION REPORTING SYSTEM

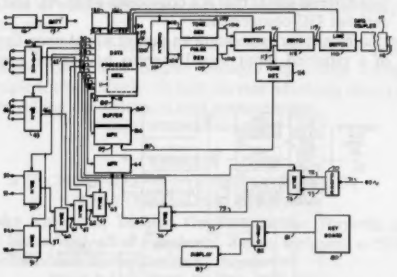
Quinto M. Bocchi, Minneapolis, Minn., assignor to Leo P. Christiansen, St. Paul, Minn., a part interest

Filed Sep. 7, 1976, Ser. No. 721,319

Int. Cl.[2] H04M *11/04*

U.S. Cl. 179—2 AM **11 Claims**

1. A remote condition reporting unit, comprising a microprocessor including memory operatively associated therewith, mean connected to said microprocessor for receiving signals indicative of a condition to be reported, means connected to said microprocessor for generating signals for initiating a telephone connection and for transmitting data thereover, and calendar clock means connected to said microprocessor for supplying time signals indicative of date and time of day thereto, said microprocessor including circuit means operable at a predetermined time for initiating a call to a central reporting station and for transmitting data thereto corresponding to said signals indicative of said condition to be reported.



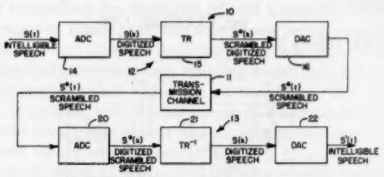
4,086,435
METHOD OF AND MEANS FOR SCRAMBLING AND DESCRAMBLING SPEECH AT AUDIO FREQUENCIES

Daniel Graupe, Fort Collins, Colo., and G. Donald Causey, Chevy Chase, Md., assignors to Biosystems Research Group II, Chevy Chase, Md.

Filed Sep. 17, 1976, Ser. No. 724,170

Int. Cl.[2] H04L *9/02*

U.S. Cl. 179—1.5 R **18 Claims**



1. A method for processing an input audio-frequency signal which is to be transmitted through a communication channel comprising

(a) scrambling the input signal by:

(1) performing an *n*-level digitization of the input signal for obtaining a digitized signal;

(2) transforming levels of the digitized signal to other levels using a pre-selected *n*-bit transformation code for obtaining a scrambled digitized signal; and

(3) converting the scrambled digitized signal into analog form to obtain a scrambled analog signal;

(b) transmitting the scrambled analog signal through the channel; and

(c) decrambling the transmitted scrambled analog signal by:

(1) performing an *n*-level digitization of the transmitted scrambled analog signal for obtaining a digitized transmitted signal;

(2) inversely transforming the levels of the digitized transmitted signal using the inverse of the pre-selected *n*-bit transformation code used in step (a)(2) for obtaining an unscrambled digitized signal; and

(3) converting the unscrambled digitized signal into analog form for obtaining a representation of the input audio-frequency signal.

4,086,436

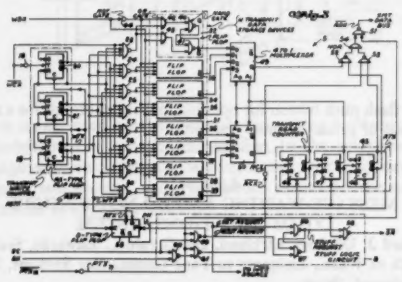
TRANSMIT AND RECEIVE DIGITAL DATA CHANNEL ELASTIC STORE

Stuart Barry Cohen, Nutley; James Monroe Clark, Cedar Grove, and Arthur Howard Magnus, Succasunna, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Continuation of Ser. No. 541,558, Jan. 16, 1975, abandoned. This application Aug. 4, 1976, Ser. No. 711,766

Int. Cl.[2] H04J *3/04*

U.S. Cl. 179—15 AF 27 Claims



1. A transmit and receive digital data elastic store comprising:

a transmit digital data elastic store including

a first input for a plurality of N-bit data streams to be transmitted, each of said data streams to be transmitted having first different bit rates, where N is an integer greater than one;

a first complementing means coupled to said first input to complement said plurality of N-bit data streams to be transmitted;

first N storage means coupled in parallel to said first input and said first complementing means;

first means coupled to each of said first N storage means and under control of a transmit write clock signal having a first given rate to steer each of the bits of said plurality of N-bit data streams to be transmitted into an appropriate different one of said first N storage means; and

second means coupled to said first N storage means and under control of a transmit read clock signal having a second given rate to steer each of the bits stored in said first N storage means to a transmit data bus at a first predetermined constant bit rate;

a receive digital data elastic store including

a second input for a plurality of received N-bit data streams, each of said plurality of received data streams having a second predetermined constant bit rate;

a second complementing means coupled to said second input to complement said plurality of received N-bit data streams;

second N storage means coupled in parallel to said second input and said second complementing means;

third means coupled to each of said second N storage means and under control of a receive write clock signal having a third given rate to steer each of the bits of said plurality of N-bit received data streams into an appropriate different one of said second N storage means; and

fourth means coupled to said second N storage means and under control of a receive read clock signal having a fourth given rate to steer each of the bits stored in said second N storage means to a receive data bus at second different bit rates corresponding to said first different bit rates.

4,086,437

RESYNCHRONIZING CIRCUIT FOR TDM SYSTEM

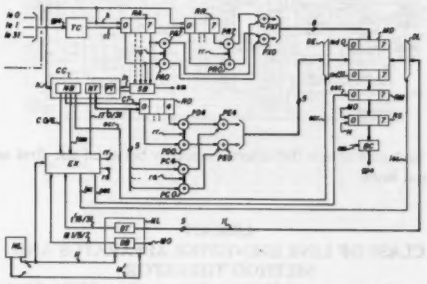
Michel André Robert Henrion, Boulogne, and André Lucien Coudray, Rueil-Malmaison, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 27, 1976, Ser. No. 726,719

Claims priority, application France, Sep. 29, 1975, 75 29725

Int. Cl.[2] H04J *3/06*

U.S. Cl. 179—15 AF 5 Claims



1. A synchronizing circuit for use in an exchange of a time division multiplex system, and in which a series of plural bit words is received by said exchange during successive time frames comprising a time slot for each word with each bit being received serially during a time element of a time slot and with each word being received at the clock rate of a distant office from which the series of words is transmitted, each word being forwarded within said exchange at a local clock rate of the same duration and extent as the clock rate of the distant office, said circuit including: a plurality of shift registers in cascade for receiving words from said office with each register capable of storing one word at a time, a multiple stage memory for storing therein in successive time slots, the words of a frame based on said distance clock rate, means in said exchange responsive to a signal for controlling storage of a word in said memory received from said shift registers, means responsive to a read signal during a preselected time element for reading a word from said memory, means for comparing a signal derived from said storage signal against said read signal, means responsive to a condition in which said derived signal coincides with a read signal for shifting said read signal to a time element spaced in time from the preselected time interval, and bistable means for causing reading of words from one or the other of said shift registers for storage in said memory dependent on the direction of said shifting.

4,086,438

AUTOMATIC INTERCONNECTION SYSTEM

Daniel W. Kahn, and Thomas A. Skidmore, both of Highland Park, Ill., assignors to Teletech Corporation, Highland Park, Ill.

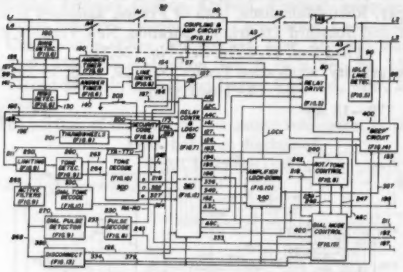
Filed Mar. 7, 1977, Ser. No. 775,263

Int. Cl.[2] H04M *3/54*

U.S. Cl. 179—18 BE 45 Claims

1. An automatic interconnection system for use at a telephone subscriber station served by first and second subscriber lines each connected to a telephone system central office, said interconnection system comprising line interconnection means coupled to the first and second lines and operable for seizing and releasing the lines and establishing interconnections therebetween, access means coupled to the first line and to said line interconnection means and responsive to access signals on the first line for causing said line interconnection means to seize the first and second lines and establish an interconnection therebetween, and reset means coupled to the second line and to said line interconnection means and responsive to reset

signals on the second line for causing said line interconnection means to release only the first line and then to re-seize the first line and reestablish the interconnection between the first and second lines.

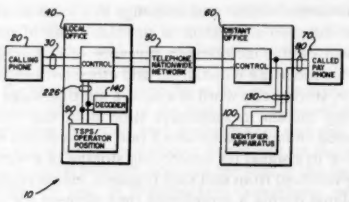


4,086,439

CLASS OF LINE IDENTIFIER APPARATUS AND METHOD THEREFOR

Sandra Rae Vowles, 1300 Utica, Denver, Colo. 80204; Michael Alan Jacobs, 1090 S. Parker Rd., Denver, Colo. 80231, and Amos Ray Jackson, 2887 McClelland St., Salt Lake City, Utah 84106

Filed Dec. 17, 1976, Ser. No. 751,490
Int. Cl.[2] H04M *5/18*
U.S. Cl. 179—27 DA **16 Claims**



1. In a telephone system having a calling phone, a called phone, an operator position, means responsive to collect call origination signals generated by said calling phone for interconnecting a communication path between said calling phone and said operator position, and means cooperative with said interconnecting means and said operator position for connecting said called phone to said communication path, an improvement to said system comprising means responsive to an answer signal from said called phone for extending a unique signal over said communication path to said operator position when said called phone is unauthorized to receive a collect call.

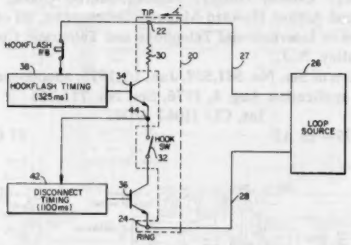
4,086,440

TELEPHONE SET WITH LOOP CURRENT INTERRUPTION TIMING CONTROL

Robert J. Hurle, Madison, Conn., assignor to Chestel, Inc., Chester, Conn.

Filed Apr. 12, 1977, Ser. No. 786,847
Int. Cl.[2] H04M *1/00*
U.S. Cl. 179—81 R **12 Claims**

8. The combination comprising a telephone set having an equivalent network resistance and a hook switch including at least one set of contacts which is open when said telephone is in an on-hook condition and which is closed when said telephone set is in an off-hook condition, said telephone set also having tip and ring terminals for connecting said telephone set in a loop circuit, a hook flash push button, a series electrical circuit between said tip terminal and said ring terminal which series circuit includes said set of contacts of said hook switch and said equivalent resistance of said telephone set in series with one another, and means responsive to operation of said hook flash push button for opening said series circuit for a time interval of predetermined duration.

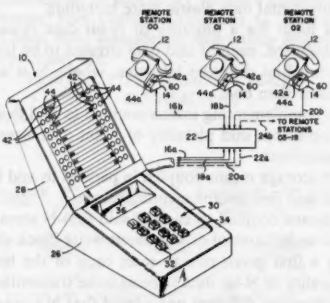


4,086,441

MESSAGE-WAITING AND DO-NOT-DISTURB COMMUNICATIONS SYSTEM

Richard J. Ullakko, Kirkland, and Gerald L. Edwards, Seattle, both of Wash., assignors to Tone Commander Systems, Inc., Redmond, Wash.

Filed Jan. 14, 1977, Ser. No. 759,359
Int. Cl.[2] H04M *3/42*
U.S. Cl. 179—84 C **26 Claims**



21. A telephone module for a telephone message-waiting and do-not-disturb communication system, said module comprising: mounting means for mounting said module on a telephone set; first visual indicator means for indicating message-waiting; second visual indicator means for indicating the status of do-not-disturb indicator means spaced therefrom; and switch means for alternatively controlling said first and second visual indicator means.

4,086,442

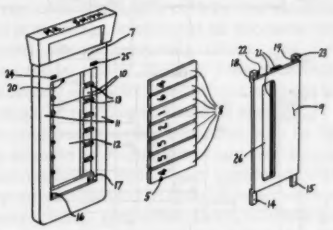
REPERTORY DIALLERS

Bryan W. Rickard, 19667 Valley View Dr., Topanga, Calif. 90290

Filed Apr. 28, 1976, Ser. No. 681,076
Int. Cl.[2] H04M *1/45*
U.S. Cl. 179—90 CS **20 Claims**

1. Card repertory dialler in which each digit of a telephone number is represented on a card by a number-block, each said number-block being capable of individual motion relative to said card, in order to change the telephone number represented by the card as a whole; and in which said cards include restraining means whereby said relative motion may be prevented, in order that the telephone number represented by the card should not change; and identifying means to automatically provide, as a result of moving the number-blocks to

represent a particular telephone number, a visual representation of the numerals comprising such telephone number in their correct sequence; and in which said number-blocks include coding means whereby the digit represented by said number-



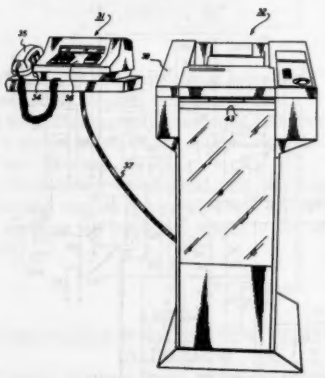
block is expressed in a form suitable for sensing for the purpose of subsequent automatic transmission to the telephone exchange; and which includes sensing means for the accomplishment of said sensing, and transmission means for the accomplishment of said transmission.

4,086,443

AUTOMATIC DIALER WITH A PROGRAMMABLE PAUSE

Michael L. Gorham, Plano, Tex., and Roger F. Norian, Norwalk, Conn., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1977, Ser. No. 793,452
Int. Cl.² H04M *1/45*
U.S. Cl. 179—90 BD **5 Claims**



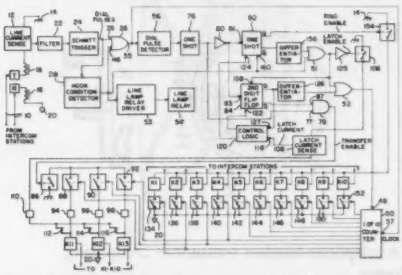
1. In an automatic telephone dialer for placing outgoing telephone calls from a terminal having a raster input scanner for sequentially scanning address cards bearing mark sense indicia identifing telephone numbers to which respective ones of said calls are to be placed; said address cards having a common, distinctive recognition code; the improvement comprising means for interrupting the scanning of successive ones of said address cards for a predetermined period of time in response to the scanning of a supplemented recognition code containing said distinctive code.

4,086,444

DIAL PULSE KEY TELEPHONE INTERCOM SYSTEM

Maurice I. Smith, Woodinville, and Victor M. DePinto, Bellevue, both of Wash., assignors to Tone Commander Systems, Inc., Redmond, Wash.

Filed Nov. 4, 1976, Ser. No. 738,859
Int. Cl.² H04M *1/72*
U.S. Cl. 179—99 **10 Claims**



1. A pulse selective key telephone communication system, comprising: line current sensing means connected with an intercom circuit operatively associated with a group of subscriber stations, each having a dial telephone and intercom use indicator means, said line current sensing means being operative to sense signals transmitted via the intercom circuit from a calling station when off-hook; resettable pulse counter means for decoding decimal station address information in the form of dial pulse signals; resettable access means operatively associated with said pulse counter means for accessing a called station having a corresponding station address in order to produce a call indication thereat; reset means for resetting said pulse counter means and said access means upon completion of call indication; indicator control means for operating said intercom use indicator means; and a hook condition detector circuit including;

a gate having at least two inputs and an output, one input connected with said line current sensing means to receive signals therefrom, and means connected between the output and the second input for maintaining a predetermined input signal level at the second input commencing after receipt at the first input of a signal sensed by said line current sensing means as the calling station assumes off-hook status, and terminating after receipt at the first input of a signal sensed by said line current sensing means as the calling station resumes on-hook status, said predetermined input signal level being sufficient to cause said gate to present a first constant level output signal while said predetermined input signal level is maintained at the second input,

said pulse counter means being operatively associated with the gate output such that it will be enabled to decode station address information only while said first constant level output signal is present at the gate output, and will be reset when said gate presents a second constant level output signal different from said first constant level output signal upon termination of said predetermined input signal level in the event the calling station resumes on-hook status before being reset by said reset means,

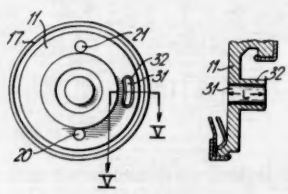
said access means being operatively associated with the gate output such that it will be reset along with said pulse counter means in the event the calling station resumes on-hook status before being reset by said reset means,

said indicator control means being operatively associated with the gate output such that it will be enabled to operate said intercom use indicator means only while said first constant level output signal is present at the gate output.

4,086,445
TELEPHONE HANDSET TRANSMITTER WITH IMPROVED OUTPUT RESPONSE

Ronald Charles Robinson, London, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jan. 21, 1977, Ser. No. 761,275
Int. Cl.² H04R 1/28
U.S. Cl. 179—121 R **4 Claims**



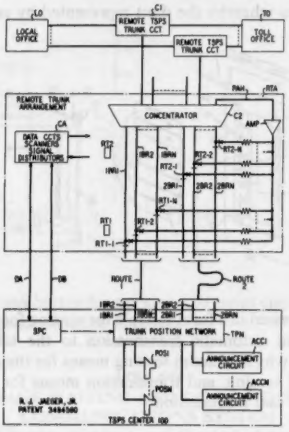
1. A telephone handset transmitter comprising:
a frame;
a diaphragm extending over one side of said frame and spaced therefrom, the periphery of said diaphragm connected to the periphery of the frame to define a first air chamber, between said diaphragm and said frame;
a cup-shaped member extending over the other side of the frame and having a peripheral portion extending towards the frame and connected to the periphery of the frame to define a second air chamber, between said cup-shaped member and said frame;
said diaphragm and said cup-shaped member forming an enclosure, said frame extending across said enclosure;
at least one aperture in said frame and interconnecting said first and second air chambers;
a perforated member extending over said at least one aperture;
a slot in said frame and interconnecting said first and second air chambers, said slot unobstructed at both ends, a tube surrounding said slot and extending from at least one side of said frame, said tube having a length/area ratio within predetermined limits, the length being the axial length of the tube plus slot thickness and the area being the area of the aperture in a plane normal to the axis of the tube;
the total acoustic resistance of said at least one aperture and said slot being less than about 20 ohms and more than zero.

4,086,446
EMERGENCY ANNOUNCEMENT SYSTEM

Robert Marvin Taylor, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 11, 1977, Ser. No. 767,685
Int. Cl.² H04M 3/08
U.S. Cl. 179—27 G **7 Claims**

1. In combination,
base and remote locations interconnected by first and second groups of trunks,
means at the remote location for connecting one trunk in said first group concurrently to each of a plurality of trunks in said second group, and

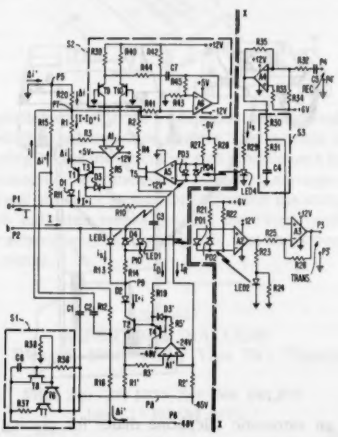


means at the base location for applying an announcement to said one trunk in said first group.

4,086,447
ELECTRONIC HYBRID CIRCUIT FOR CONNECTING A TWO-WIRE LINE TO SWITCHING SYSTEM

Hans Rudolf Schindler, Langnau, and Peter Vettiger, Thalwil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1977, Ser. No. 769,247
Claims priority, application Switzerland, Mar. 2, 1976, 2548/76
Int. Cl.² H04B 1/58
U.S. Cl. 179—170 NC **11 Claims**



1. In a communications network having a plurality of audio devices, a four wire switching network at a central location and a two-wire line connecting each audio device with said central location, a hybrid circuit for each two-wire line to connect said line to the four wires of said switching network, said hybrid circuit including a pair of regulated current sources providing a positive current to the one and a negative current

to the other wire of said two-wire line, and said hybrid circuit further comprising:

a single control current generating circuit common to said pair of regulated current sources,

a current control means in each current source and responsive to a voltage furnished at an associated output of said control current generating circuit, said voltage being proportional to said common control current to control the current in its associated current source to be a constant multiple of said common control current,

a first optocoupler device connected with its light-generating means to an output port of said switching network for receiving audio signals and connected with its light-responsive means to the input of an active element in said control current generating circuit, to enable generation of a common control current consisting of a direct current and a superimposed audio signal current, and

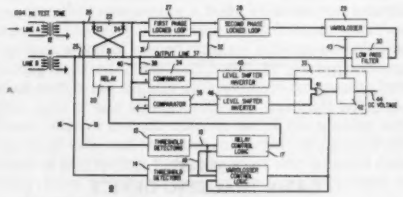
a second optocoupler device connected with its light-generating means to said two-wire line for receiving audio signals and connected with its light-responsive means to an input port of said switching network.

4,086,448

LOOP-AROUND TEST CIRCUIT FOR TELECOMMUNICATIONS LINES

Ronald Edward Anglikowski, Bayville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 18, 1977, Ser. No. 788,545
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **6 Claims**



6. A loop-around telephone circuit comprising:

an input and an output;

means for interchangeably connecting said circuit to a first and a second telephone line without metallically connecting said lines; and

means for receiving a tone signal on a one of said lines, for replicating same in frequency, phase and amplitude and for applying said replicated signal to the other of said lines.

4,086,449

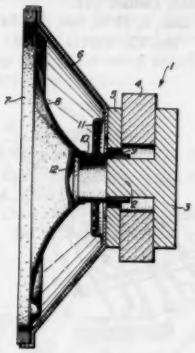
LOUDSPEAKER WITH BURNING RESISTANT DIAPHRAGM

Kazuro Takano, Hirakata, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 576,380, May 12, 1975, abandoned. This application Nov. 5, 1976, Ser. No. 739,141
Claims priority, application Japan, May 14, 1974, 49-54239
Int. Cl.² H04R *7/00*; G10K *13/00*; C09K *3/28*
U.S. Cl. 179—181 R **1 Claim**

1. In a loudspeaker with a diaphragm made of pulp fibers, the improvement comprising

using as said pulp fibers, pulp fibers that have been deposited with about 30 to about 40% by weight of a mixture consisting of highly condensed water-insoluble ammonium polyphosphate having been chemically condensed by the addition of about 2 to about 3% by weight of polyethyleneimine and having been further mixed with about 5 to



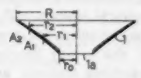
about 6% by weight of a neoprene series rubber latex, all percentages by weight based on said pulp fibers.

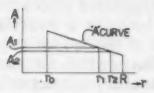
4,086,450

VARIABLE THICKNESS CONE FOR A DYNAMIC SPEAKER AND QUALITY CONTROL INSPECTION METHOD THEREFOR

Kenzo Inoue, 22, Kitatanda, Yofu-cho, Tokai-shi, Aichi-ken, Japan

Filed Nov. 9, 1976, Ser. No. 740,292
Claims priority, application Japan, Jun. 25, 1976, 51-075894
Int. Cl.² H04R *7/12*
U.S. Cl. 179—181 R **3 Claims**





1. A convex cone of truncated conical form for use in a dynamic speaker having a number of integrally formed radial ribs thereon, extending from the throat portion toward the peripheral portion thereof, said cone being characterized by the relationship

$A_1 > A_2$ so long as $r_1 < r_2$, where A_1 and A_2 are the cross sectional areas of said cone when said cone is cut parallel to the axis of said cone at radii r_1 and r_2 respectively.

3. A method of inspecting the manufacture of a substantially convex truncated conical form for a dynamic speaker, which method comprises the following comparison as an inspection process:

(a) cutting said cone parallel to the axis of said cone in 2 places, distances r_1 and r_2 from the axis of said cone, r_1 being less than r_2;

(b) rejecting the manufactured cone if the cross sectional areas A_1, produced by cutting said cone in step (a) at r_1, is less than or equal to A_2, the cross sectional area produced by cutting said cone is step (a) at r_2;

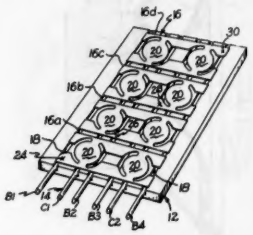
(c) accepting the manufactured cone if the cross sectional area A_1 is greater than A_2.

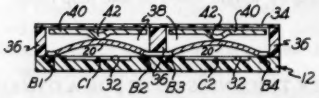
4,086,451

KEYBOARD APPARATUS

Henry J. Boulanger, Cumberland, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 6, 1976, Ser. No. 747,655
Int. Cl.[2] H01H *13/70*
U.S. Cl. 200—5 A **12 Claims**





1. Keyboard apparatus having a plurality of switching stations comprising a substrate having a top surface, a plurality of spaced stationary electrical contacts disposed on the substrate, a plurality of snap-acting electrically conductive disc elements disposed on the substrate overlying the stationary contacts, each disc element disposed at a switching station, each disc element adapted to move into and out of engagement with a stationary contact, means to connect the disc elements and the contacts to an electrical source, a thin cover having a flat top surface mounted on the substrate overlying the top surface and spaced therefrom, the cover having indicia to identify the location of the switching stations, and tactile feedback means disposed intermediate each disc and the flat cover, the tactile feedback means comprising a separate rigid plate like member for each switching station having a protrusion extending therefrom, the protrusion generally aligned with and extends toward the center of a respective snap acting disc whereby upon depression of the cover at a switching station by an operator's finger the feel of the sudden snapping of the disc from an unactuated position in which the disc element is out of engagement with any stationary contact to an actuated position in which the disc element is in engagement with a stationary contact is transmitted to the operator's finger.

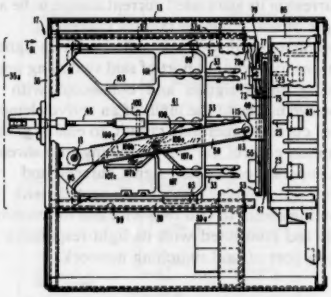
4,086,452

ISOLATING SWITCH SHUTTER ASSEMBLY FOR HIGH VOLTAGE MOTOR STARTER

James D. Collins, Elma, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 2, 1976, Ser. No. 672,897
Int. Cl.[2] H01H *9/22*
U.S. Cl. 200—50 AA **4 Claims**

1. A switching apparatus comprising a cabinet housing having a rear panel, first and second electrical terminal contact assemblies mounted in spaced locations on the interior surface of the rear panel, electrical conductor means for providing a circuit between the first and second terminal contact assemblies and comprising a movable contact member, the isolating switch structure comprising track means, said structure being movable between retracted and advanced positions of the rear panel, a carriage mounted on the track means and movable between retracted and advanced positions of the rear panel and comprising a cam, the movable contact member being mounted on the carriage and movable by the carriage between open and closed positions with the first terminal contact assembly corresponding to the retracted and advanced positions of the carriage, manual means including handle means connected to the carriage for moving the carriage between the retracted and advanced positions, a safety shutter between the movable contact member and said first terminal-contact assembly when the carriage is in the open contact position, operating means



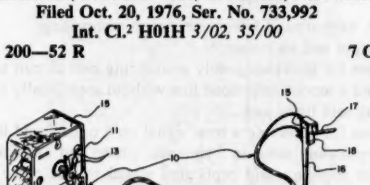
for moving the safety shutter to a retracted position when the carriage moves to the closed contact position, the operating means comprising a shutter lever pivotally mounted at one end at a fixed location and connected at the other end to the safety shutter, a cam follower on the lever, the cam comprising a pair of spaced lineal camming surfaces disposed on opposite sides of the cam follower and extending at an angle inclined to the direction of movement of the carriage.

4,086,453

GAME TRACKING DEVICE

Joseph R. Bresan, P.O. Box 8611, Greenboro, N.C. 27410

Filed Oct. 20, 1976, Ser. No. 733,992
Int. Cl.[2] H01H *3/02, 35/00*
U.S. Cl. 200—52 R **7 Claims**



1. A tracking device to determine the time of the day when an animal first comes to a staked-out location comprising:

(a) a timing means powered by connection through an electrical circuit to a portable power source;

(b) a pair of lead wires connected to a break in the electrical circuit between the power source and the timing means;

(c) a pressure switch electrically connected to the two lead wires capable of completing and interrupting the circuit between the power source and the timing means; and

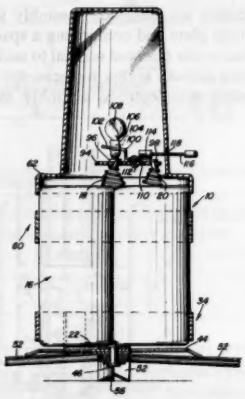
(d) a tidbit holding means for holding tidbit very appetizing to the animal and being connected to the pressure switch such that when the tidbit is placed on or removed from the tidbit holding means, that placement or removal controls the on-off position of the switch and changes the running of the time means to the opposite mode.

4,086,454

BATTERY SUPPORTED LIGHT WITH CIRCUIT MAKER AND BREAKER HAVING TERMINALS AND MOUNTING PLATE DIRECTLY MOUNTED TO BATTERY COIL SPRING ELECTRODES

Otto J. Bluhm, 118 Adolph St., Wausau, Wis. 54401

Division of Ser. No. 487,253, Jul. 10, 1974, Pat. No. 3,980,989.
This application Jun. 22, 1976, Ser. No. 698,687
Int. Cl.[2] H01H *1/00;* F21L *7/00;* F21V *23/04;* H01R *13/00*
U.S. Cl. 200—60 7 Claims



1. In combination with a storage battery of the type including a pair of generally parallel, spaced and outwardly projecting contact terminal defining resilient coil springs, a terminal mount assembly comprising a body of dielectric material for disposition outwardly of and supported from the outer ends of said springs, a pair of spaced terminal ends supported from and projecting outwardly from said body, the spacing between said terminal ends being slightly different than the spacing between the free ends of said springs with said free ends being slightly displaced relative to each other to match the spacing between said terminal ends and the latter removably telescoped into the free ends of said springs to thus support said terminal ends and the body, from which said terminal ends are supported, solely from said springs and thus from said battery.

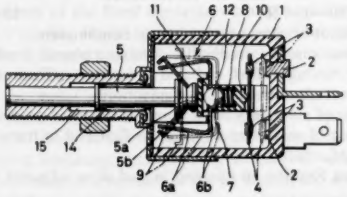
3. The combination of claim 1 wherein said body comprises a panel member disposed generally normal to said coil springs, said terminal ends comprising end extensions of terminal members secured through said panel member.

4,086,455

SNAP ACTION TYPE OF ELECTRIC SWITCH

Fumitaka Takahashi, Mizohata, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1977, Ser. No. 783,445
Claims priority, application Japan, Apr. 7, 1976, 51-42029
Int. Cl.[2] H01H *15/18*
U.S. Cl. 200—76 7 Claims



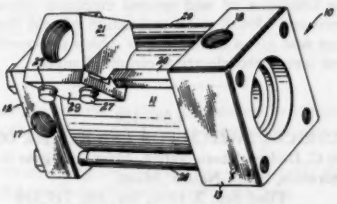
1. A snap action type of electric switch comprising: a housing; a contact plate having a movable contact facing a stationary contact in said housing and being free to move back and forth; an intermediate snap spring; a switching rod extending at the back of said snap spring and being free to move back and forth; said contact plate being connected through said intermediate snap spring to said switching rod; auxiliary spring means urging said contact plate in a forward direction; said contact plate having a play space in forward and rearward directions in relation to said snap spring and being urged in forward direction by said auxiliary spring means.

4,086,456

MOUNTING FOR MAGNETIC SWITCH

Kendall Frederick Bone, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Oct. 4, 1976, Ser. No. 729,297
Int. Cl.[2] H01H *35/38*
U.S. Cl. 200—82 E 9 Claims



1. In a cylinder assembly for use in a fluid pressure system, said cylinder assembly having a cylinder body, a head secured to each end of the cylinder body, a piston axially movable within the body in accordance to fluid pressure applied through one of the heads and a magnetic switch for detecting relative position between the piston and cylinder body wherein the improvement comprises:

a tie rod securing a fluid seal between the heads and the cylinder body extending between the heads on each end of the cylinder in juxtapositional relationship to said cylinder body, said tie rod having a non-circular cross-section of varying diametral dimension;

a first gripping surface upon the magnetic switch, said first gripping surface engaging said tie rod to intimately position the switch with respect to the cylinder;

a fastening plate having a second gripping surface engaging the tie rod and positioned thereon such that the cross-sectional dimension of the tie rod between the gripping surfaces is at a relative minimum;

means for selectively reducing the distance between the gripping surfaces and simultaneously compressing the tie rod with the gripping surfaces.

4,086,457

FLOAT SWITCH SIGNALLING TWO DIFFERENT LIQUID LEVELS

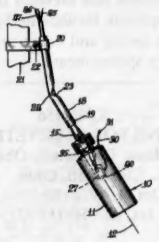
Karl O. Niedermeyer, 17WO68 North St., Bensenville, Ill. 60106

Filed Dec. 16, 1976, Ser. No. 751,117
Int. Cl.[2] H01H *35/18*
U.S. Cl. 200—84 R 10 Claims

1. In a float switch apparatus for use with a body of liquid having an exposed surface, which apparatus includes a float having an end and defining an axis intersecting said end, means for mounting said float and attached to said end so that, when the float is at said surface, the inclination of the float axis varies as the level of said surface varies, and electrical circuit means including a mercury switch secured to the float and positioned at a given angle with respect to said axis whereby an electrical circuit formed by said circuit means changes condition between open and closed at a given inclination of the float, the further improvement wherein:

said electrical circuit means including a second electrical

circuit having a second mercury switch therein, said second mercury switch being secured to said float and positioned at another angle with respect to said axis to change



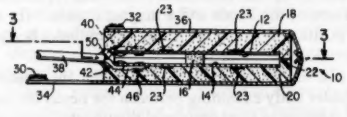
the condition of said second electrical circuit between open and closed at an inclination of said float different than said given inclination at which the condition of the first mentioned electrical circuit changes.

4,086,458

ELECTRICAL SWITCH FOR USE BY THE DISABLED

Herbert C. Dickey, South Natick, Mass., assignor to The Ealing Corporation, South Natick, Mass.

Filed Sep. 2, 1976, Ser. No. 719,929
Int. Cl.[2] H01H *3/02*
U.S. Cl. 200—85 R **17 Claims**



1. An electrical switch, comprising:

(a) housing means defining an aperture, said housing means being made of a bendable material which incorporates air spaces positioned, configured and dimensioned to allow said housing means to be compressed to a smaller size;

(b) a resilient contacting assembly positioned within said aperture, said resilient contacting assembly comprising:

(i) a pair of planar electrically conducting contacting members at least one of which is flexible; and

(ii) compressible means for maintaining said pair of members in spaced relationship to each other in such a position that application of a force to said housing means results in deflecting said housing means and coupling said force to said flexible contacting member, flexing said flexible contacting member and bringing the contacting members into contact with each other; and

(c) electrical conductor means having at least two electrically conducting elements, each of said elements being electrically connected to one of said electrically conducting contacting members.

4,086,459

ROD ARRAY VACUUM SWITCH FOR HIGH VOLTAGE OPERATION

Joseph A. Rich, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

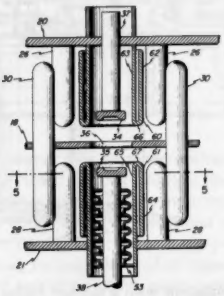
Filed Mar. 11, 1977, Ser. No. 776,641
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**

1. A vacuum switch having two separate arcing stages in cascade, comprising:

a hermetically sealed, evacuated envelope having first and second base plates at opposite ends of said envelope and a central base plate disposed in said envelope to partition said envelope into first and second regions, each of said base plates being parallel to each other;

first and second primary arc-electrode assemblies supported by said first and second respective base plates, disposed in said first and second regions, respectively, each of said primary arc-electrode assemblies comprising a spaced circular array of rod electrodes oriented normal to the plane of said base plates and having smooth arcing surfaces, said first and second primary arc electrode assemblies being substantially aligned longitudinally with each other;

an intermediate arc-electrode assembly supported by said central base plate and comprising a spaced circular array of rod electrodes oriented normal to said central base plate and having smooth arcing surfaces, the electrodes of said intermediate arc-electrode assembly extending into said



first and second regions in an interdigitated alternating sequence with said primary electrodes disposed in said first and second regions in an interdigitated alternating sequence with said primary electrodes disposed in said first and second regions, respectively; and

first and second butt contacts for conducting normal steady-state current situated centrally within the respective circular arrays of rod electrodes, said first butt contact being situated entirely within said first region and mechanically and electrically coupled to said first base plate, said second butt contact being electrically coupled to said second base plate and longitudinally movable through a central aperture in said central base plate so as to be entirely within said first region when contacting said first butt contact and retractable entirely into said second region when said first and second butt contacts are parted upon occurrence of a current overload condition.

4,086,460

CIRCUIT BREAKER HAVING IMPROVED LINE STRAP CONSTRUCTION

Stephen F. Gillette, Rocky Hill, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 17, 1977, Ser. No. 778,814
Int. Cl.[2] H01H *33/12*
U.S. Cl. 200—146 R **10 Claims**

1. A circuit breaker comprising, in combination:

A. at least one longitudinally elongated planar, conductive strap having a first end and a second end adapted for external electrical circuit connection;

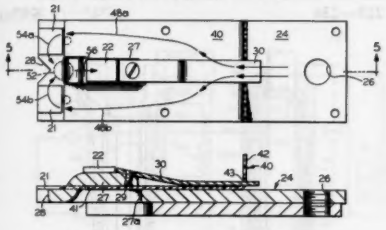
B. a pair of stationary main contacts mounted on the upper surface of said strap adjacent its first end in transversely aligned, spaced apart relation;

C. means forming an opening in said strap adjacent its first end;

D. a rigid conductive member joined at one end to said strap along a transversal edge of said opening located intermediate said main contacts for cantilevered extension in spaced relation to said strap toward its second end;

E. a stationary arcing contact mounted on the upper surface of said conductive member;

F. a contact assembly including a pair of movable main contacts and a movable arcing contact movable into and



out of engagement with said stationary main and arcing contacts; and

G. an arc chute positioned over said strap in proximity with said movable and stationary arcing contacts.

4,086,461

HIGH-VOLTAGE CIRCUIT-INTERRUPTERS

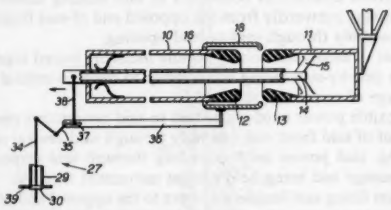
Stanislaw Mieczyslaw Gonek, Newcastle-upon-Tyne, England, assignor to Reyrolle Parsons Limited, Newcastle-upon-Tyne, England

Filed Sep. 30, 1975, Ser. No. 618,249

Claims priority, application United Kingdom, Oct. 1, 1974, 42654/74; Jan. 31, 1975, 4317/75

Int. Cl.[2] H01H *33/80*

U.S. Cl. 200—148 R **17 Claims**



1. A high-voltage circuit-interrupter having a contact arrangement for operation within an enclosure containing an insulating fluid medium, the interrupter comprising a pair of tubular fixed contacts having adjacent ends spaced apart, and each fixed contact including a bore containing a rooting electrode in electrical connection with the fixed contact, and at least one of the rooting electrodes being movable within its fixed contact to engage with and disengage from the other rooting electrode, and an external movable bridging contact which retractibly engages and electrically bridges the spaced adjacent ends of the fixed contacts, circuit-breaker operating means for moving the bridging contact clear of the end of one of the fixed contacts and for introducing a jet stream of the insulating medium at higher pressure than that in the interiors of the fixed contacts through the gap between the ends of the fixed contacts and into the interiors thereof, the spaced adjacent end of each of the tubular fixed contacts includes an arc-resistant insulating nozzle having an internal bore diverging in a direction downstream of the jet stream and away from the end of the respective fixed contact, and the circuit-breaker operating means operating at least one movable rooting electrode to separate the rooting electrodes so that the jet stream of the higher-pressure medium is directed at an arc drawn between the separated rooting electrodes.

4,086,462

INDUCTION HEATING SYSTEM FOR THE CONTINUOUS FLOW HEATING OF WORKPIECES

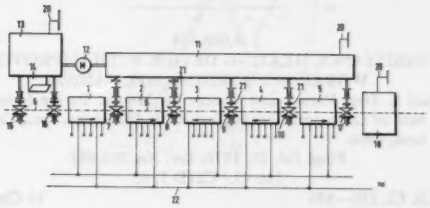
Friedrich Scheffler, and Ernst Stangl, both of Remscheid, Germany, assignors to AEG-Elotherm G.m.b.H., Remscheid-Hasten, Germany

Filed Aug. 20, 1976, Ser. No. 716,354

Claims priority, application Germany, Sep. 3, 1975, 2539083

Int. Cl.[2] H05B *5/06*

U.S. Cl. 219—10.71 **4 Claims**



1. An induction heating system for heating in continuous passage of workpieces provided with a longitudinal axis, comprising:

means for transporting said workpieces successively along a path in the direction of their longitudinal axis;

a plurality of induction coils successively encompassing the workpieces along said path which can be supplied with alternating currents from at least one source of current;

means preceding said induction coils in the path of said workpieces for feeding the workpieces to said path; and

means following said coils for removing the workpieces from said path, and means for supplying the individual induction coils with AC currents so that the differences of the electric potential, measured in the longitudinal direction of the strand and induced by their alternating fields in a plurality of workpieces resting without gaps on the continuous path of transportation between the beginning of the first induction coil and the end of the last induction coil is substantially zero.

4,086,463

FLUX-CORED WIRE

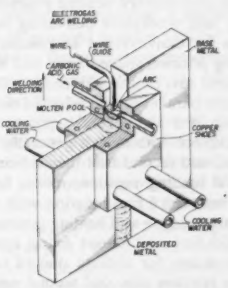
Jimpei Omori, Nishinomiya; Mitsuo Kono, Kodaira; Torataro Takeuchi, Chigasaki, and Noboru Oikawa, Yokohama, all of Japan, assignors to Tsukishima Kikai Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 413,633, Nov. 7, 1973, abandoned. This application Jan. 26, 1976, Ser. No. 652,158

Claims priority, application Japan, Nov. 13, 1972, 47.113604

Int. Cl.[2] B23K *35/30*

U.S. Cl. 219—145.22 **5 Claims**



1. A flux-cored wire for automatic electrogas vertical arc welding of austenitic stainless steel comprising:

a sheath of steel hoop made of material selected from a

group of materials consisting of mild steel and stainless steel; and

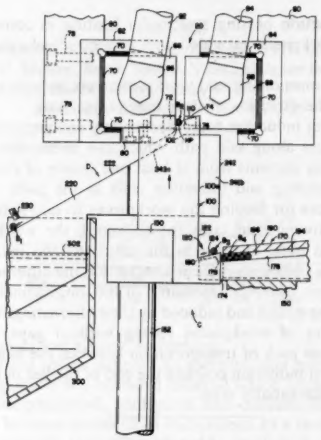
a flux provided internally within said sheath said flux containing from substantially 5% to substantially 20% CaF_2, from substantially 1% to substantially 20% Fe—Si, from substantially 1% to substantially 5% SiO_2, from substantially 1% to substantially 6% $CaCO_3$, from substantially 10% to substantially 70% Cr, from substantially 5% to substantially 40% Ni, from substantially 0% to substantially 70% Fe and from substantially 1% to substantially 20% Mn by weight.

4,086,464

RESISTANCE HEATING DEVICE WITH IMPROVED WORKPIECE FEEDING MECHANISM

Paul L. Day, Parma, and George M. Mucha, Parma Heights, both of Ohio, assignors to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Jul. 20, 1976, Ser. No. 706,852
Int. Cl.[2] C21D *9/62*
U.S. Cl. 219—156 **14 Claims**



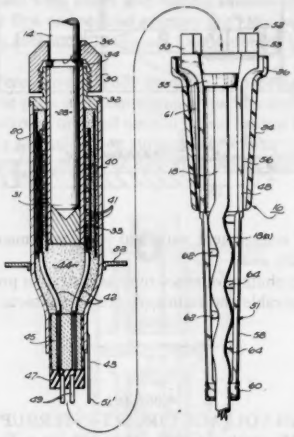
1. In a device for resistance heating of an elongated, generally cylindrical metal workpiece preparatory to quench hardening, said workpiece having a central, elongated axis and axially spaced first and second ends, said device including first and second axially spaced electrode means for directing electrical current through said workpiece and between said spaced ends as said workpiece is supported in a selected, generally horizontal heating position with said central axis extending in a selected direction, and means for delivering a succession of said workpieces to said selected heating position, the improvement comprising: said workpiece delivering means including conveying means for conveying a succession of said workpieces to a loading position spaced from said heating position and with the central axis of a workpiece in said loading position being generally parallel to said selected direction; a transfer element having first and second separate nest means for supporting a workpiece with its axis generally parallel to said selected direction, said second nest means being spaced horizontally from said loading position; means for moving said transfer element between a first location with a workpiece in said first nest means being in said heating position and a second location with said first nest means being spaced from said heating position; means for shifting one of said workpieces from said loading position onto said second nest means as said transfer element moves toward said first location; and, means for transferring a workpiece from said second nest means to said first nest means upon movement of said transfer element from said first location toward said second location.

4,086,465

ELECTRIC SOLDERING IRON

Joseph A. Sylvester, San Dimas, Calif., assignor to Solder Removal Co., Covina, Calif.

Filed Jan. 2, 1976, Ser. No. 646,313
Int. Cl.[2] H05B *3/06*; B23K *3/04*; H01R *13/58*
U.S. Cl. 219—236 **6 Claims**



1. An electric soldering iron comprising:

a front end assembly having a tip at one end defining a working surface, a fastening structure at the opposed end of said assembly including a radial flange and means defining a central opening at said opposed end into said front end assembly, said front end assembly further including electric heating means for heating said tip;

electrical conductors connected to said heating means and passing outwardly from the opposed end of said front end assembly through said central opening;

a pair of elongated unitary handle members mated together in side-by-side facing relationship to define a central passage of serpentine shape;

a flexible power cord connected to said conductors passing out of said front end assembly through said central opening, said power cord extending through said serpentine passage and being held against movement thereby;

means fixing said handle members to the opposed end of said front end assembly with said handle members in abutment with said radial flange; and

a longitudinally slidable tubular collar disposed on and surrounding said pair of mated handle members immediately adjacent said radial flange, said collar having a plurality of radially spaced apart internal ridges engaged with the outer surface of said mated handle members for holding said members in mated relationship and spacing said collar therefrom whereby to provide open spaces between said collar and said mated handle members.

4,086,466

AUTOMATIC HEATER CONTROLLER

Ronald S. Scharlack, 121 Colbourne Crescent, Brookline, Mass. 02146

Filed Apr. 30, 1976, Ser. No. 682,128
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—494 **28 Claims**

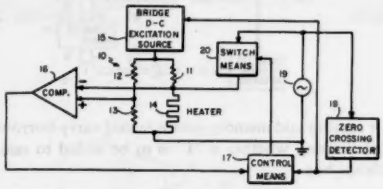
1. A system for controlling the temperature of a heater apparatus having a heater element therein, the electrical resistance of said heater element determining the temperature of said apparatus, said system comprising

means for providing a heater voltage for said heater element;

means responsive to said heater voltage for detecting zero crossings thereof;

means responsive to said zero crossing detecting means for providing sensing excitation voltage at or near said zero crossings;

circuit means including said heater element and responsive to said sensing excitation voltage for sensing the excitation voltage at said heater element and for providing a reference voltage;



means for comparing said excitation voltage at said heater element and said reference voltage for producing an output representing the polarity of the difference therebetween; and

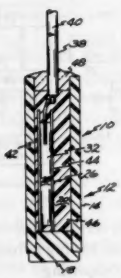
control means responsive to said zero-crossing detecting means and to the output from said comparing means for controlling the application of said heater voltage to said heater element at or near said zero crossings.

4,086,467

ELECTRONIC HEATER FOR HIGH VOLTAGE APPLICATIONS

John L. Grant, Halifax, Morocco, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Jul. 19, 1976, Ser. No. 706,652
Int. Cl.[2] H05B *3/02;* **H01C** *7/02*
U.S. Cl. 219—544 **8 Claims**



1. A self-regulating heater comprising:

a housing;

a heater assembly within said housing, said heater assembly incorporating a heating means constituted by a self-heating positive temperature coefficient resistor element having low initial resistance which increases abruptly as its temperature rises above a given level, said element of generally parallelpiped shape having a first or thickness dimension less than a second or width dimension yielding two parallel face surfaces of larger area than two parallel edge surfaces, said two parallel edge surfaces each having a layer of electrically conductive material applied thereto forming an ohmic contact surface thereon which is electrically spaced from the other layer by the heater material therebetween, said assembly further incorporating a pair of heat sink plates of thermally conductive material secured to said face surfaces; and

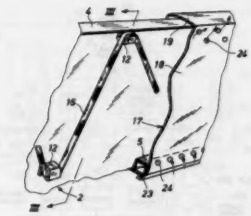
terminal means connected to respective edge surfaces and extending from said housing for supplying electrical power to said element.

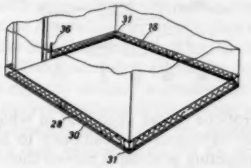
4,086,468

BASEBOARD ELECTRIC HEATING APPARATUS

Erik Christian Vilhelm Keldmann, Acasievej 5, 4490 Jerslev, Denmark

Filed Jul. 17, 1975, Ser. No. 596,805
Claims priority, application Denmark, Jul. 23, 1974, 3959/74
Int. Cl.[2] H05B *1/00;* **F24H** *3/00, 9/10;* **F24D** *13/02*
U.S. Cl. 219—377 **1 Claim**



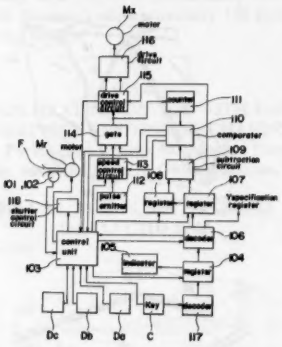


1. A baseboard electric heating apparatus of the type which is adapted to be mounted at the floor along the walls in a room which is to be heated and to constitute a baseboard along the walls of the room, said apparatus including a plurality of elongated apparatus sections, each apparatus section comprising a box-shaped housing in which an electric heating element is mounted, each apparatus section having air inlet and air outlet openings for the flow of air therethrough by convection and the exposed outer surface of each apparatus section defining a heat radiating surface whereby heat from the heating element can be delivered to the room partly by radiation from the exposed surface and partly by convection via air circulating through the apparatus section, said plurality of apparatus sections being interconnected end-to-end and being mounted at the floor as a baseboard along all of the walls of the room to be heated whereby the heating apparatus surrounds the space to be heated, connecting means interconnecting said heating elements of the respective sections in such a way that power can be fed to the heating elements from one end of the interconnected array of apparatus sections, said plurality of apparatus sections so constructed that approximately 65–75 percent of the heat therefrom is delivered by radiation and approximately 25–35 percent is delivered by convection, said individual apparatus sections comprising a rectangular inner part having a plane, in mounted position vertical, main portion and an upper and lower flange portion projecting away from the wall in the room, said inner part carrying eye-like members for supporting said heating element in said housing and supporting and distance members which are adapted to mount the main portion at a predetermined distance from the wall of the room and to engage mounting means on the wall of the room, and further, an outer part consisting of a plane main portion of the same shape as the main portion of the inner part and having upper and lower flange portions projecting towards the main portion of said inner part and which extend over and under the flange portion of the inner part, respectively, and have bent rim portions engaging the rear side of the inner part, at the top and the bottom of the main portion of the outer part, horizontal rows of air holes being provided to form said air inlet and air outlet openings.

4,086,469
MICROFICHE READER CONTROL MEANS

Shiro Toriumi, Machida, and Hiroshi Endo, Fuchu, both of Japan, assignors to Minolta Camera K.K., Osaka, Japan

Continuation-in-part of Ser. No. 624,577, Oct. 21, 1975, abandoned. This application Jul. 19, 1976, Ser. No. 706,562
Claims priority, application Japan, Nov. 2, 1974, 49-126864
Int. Cl.[2] G06M *3/02*; G03B *23/08*
U.S. Cl. 235—92 MP **4 Claims**



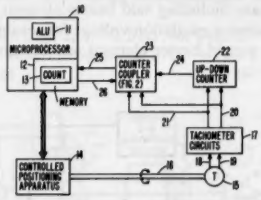
1. In a microfiche reader apparatus in which a microfiche having number of frames so positioned to have one of the frames at a projecting position is moved therefrom to bring a designated frame to the projecting position for viewing of an enlarged image on a screen, said apparatus comprising a microfiche supporting means for supporting the microfiche thereon and being movable in the directions of first and second axes at right angles to each other, a control means for moving said supporting means supporting the microfiche with said one of the frame at the projecting position to bring the designated frame to the projecting position, said control means including a key means for specifying the particular frame of the microfiche by a series of numbers, said microfiche having a plurality of frames in rows and columns perpendicular to each other with each of the frames numbered in series, a clock pulse means for supplying a number of pulses equal to the number of the designated frame specified by said key means, a first counter for receiving and counting the pulses from said clock pulse means and a pulse subtractor associated with said first counter for subtracting one pulse supplied by said clock pulse means so that the number of pulses counted by said first counter is one less than the number of pulses supplied by said clock pulse means, a second counter associated with said first counter for being incremented by one every time a particular number of pulses is counted by said first counter, and means determining number of frames to be moved in the directions of said first and second axes by comparing the outputs from said first and second counters with the position of said supporting means for moving said supporting means to bring the designated frame to the projecting position.

4,086,470
HARDWARE-SOFTWARE COUNTING

William Henry Ashbee, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1976, Ser. No. 754,766
Int. Cl.[2] G06M *3/14*; H03K *21/10*
U.S. Cl. 235—92 DP **8 Claims**

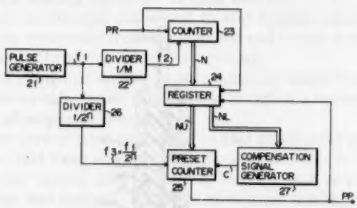
1. A hardware-software counter comprising a hardware counter for counting lower significant bits, a carry-borrow circuit responsive to a higher order bit position of said counter and including cancel means responsive to successively received carry and borrow signals to cancel a respectively represented carry and borrow, memory means in the carry-borrow circuit separately memorizing a received carry or borrow, means responsive to said memory means to deactivate said cancel means, and a microprocessor including an adder for counting higher significant bits and means in said microprocessor for sensing said memory means in said carry-borrow circuit for determining whether a "1" is to be added to said higher significant bits.



4,086,471
PULSE TRAIN CONVERTER

Yukiharu Takahashi, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 6, 1977, Ser. No. 785,114
Claims priority, application Japan, Apr. 7, 1976, 51-38896
Int. Cl.[2] H03K *21/36*
U.S. Cl. 235—92 DM **5 Claims**



1. A pulse train converter for converting a first pulse train into a second pulse train having a frequency higher than that of the first pulse train, comprising:

a pulse generator for generating pulses having a specified frequency;

a frequency divider for dividing the output frequency of the pulse generator by $(M/2^n)$, where n denotes an integer and M denotes the number of parts into which the time period of the pulses contained in said first pulse train is divided by the pulses contained in said second pulse train;

a counter which is reset upon receipt of each pulse of said first pulse train and starts to count the output pulses supplied from said frequency divider,

a register for storing the count of said counter upon receipt of each pulse of said first pulse train;

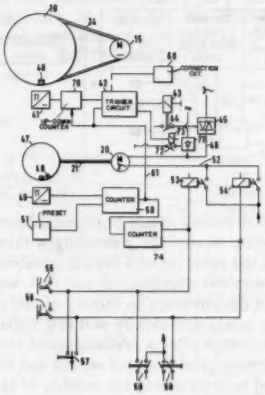
a pulse delivering means which receives only the remaining higher order bits except lower order n bits of the count stored in said register as a reference value and which delivers pulses constituting said second pulse train each time the number of pulses it receives from said pulse generator equals the reference value; and

a compensation means for compensating said reference value in accordance with the count value represented by said lower order n bits supplied from said register.

4,086,472
APPARATUS FOR CONTROLLING THE LAYING OF STRIP MATERIAL

Harald Sikora, Bremen, Germany, assignor to Harald Sikora Sikora Industrieelektronik, Bremen, Germany

Filed Jun. 1, 1976, Ser. No. 691,584
Claims priority, application Germany, Jun. 3, 1975, 2524411
Int. Cl.[2] G06M *3/02;* B65H *57/28*
U.S. Cl. 235—92 DN 12 Claims



1. Apparatus for controlling for the laying of strip material on a rotating drum having a laying guide, the guide and drum being relatively moveable with respect to each other in a direction parallel to the axis of the drum, the movable one of the guide or drum having a movement continuing inertia, said apparatus comprising:

rotary alternating current induction motor drive means operatively associated with one of said drum and guide for providing movement between the two;

first indicator means for indicating the rotation of the drum;

control means connected to said drive means, said control means being coupled to, and operable by, said first indicator means for energizing said drive means to provide the relative movement responsive to rotation of the drum;

second indicator means for indicating relative movement of the drum and guide and for providing a digital feedback signal proportional to the amount of such movement;

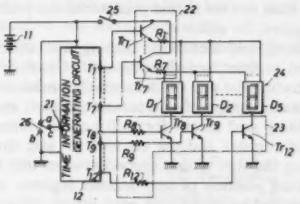
preset means providing a digital reference signal corresponding to a desired incremental amount of such movement; and

digital signal counter means coupled to said preset means for receiving and storing said digital reference signal, said digital signal counter means being coupled to said second indicator means for receiving and ascertaining the magnitude of said feedback signal, said digital counter comparing said reference and feedback signals and being coupled to said control means for deenergizing said drive means when the magnitude of said feedback signal attains that of the reference signal, said digital signal counter means storing digital feedback signals resulting from the inertial movement of the movable one of the drum and guide for altering a subsequent comparison of the reference and feedback signals in accordance with the stored signals.

4,086,473
DISPLAY DEVICE FOR ELECTRONIC APPARATUS

Shigeki Kumagai, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1977, Ser. No. 767,114
Claims priority, application Japan, Feb. 10, 1976, 51-13553
Int. Cl.[2] H03K *21/22*
U.S. Cl. 235—92 EA 6 Claims

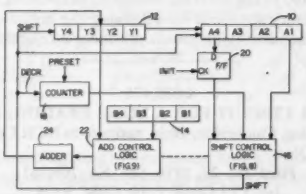


1. A display device for electronic apparatus comprising a display information generating circuit which comprises a time display information generating circuit including an oscillator, a frequency divider for frequency dividing an oscillation frequency of the oscillator, a counter circuit for counting output pulses of the frequency divider according to time units, a multiplexer for receiving outputs of the counter and generating binary time information, a decoder for generating segment drive signals and digit generating circuit for generating digit drive signals responsive to the binary time information generated by said multiplexer, blanking signal generating means for selectively generating blanking signals; a gate circuit having a plurality of first input terminals for receiving the segment drive signals of said decoder and digit drive signals of said digit generating circuit, second input terminals for receiving a blanking signal of said blanking signal generating means, and output terminals corresponding to said segment drive signals and said digit drive signals, and adapted to block both the drive signals when said blanking signal is received; a first amplifier circuit for amplifying the segment drive signals from the output terminals of the gate circuit; a second amplifier circuit for amplifying the digit drive signals from the output terminals of the gate circuit; and a dynamic drive type display unit comprising a plurality of display sections each constructed of a plurality of display segments adapted to receive amplified segment drive signals of the first amplifier circuit, said plurality of display sections being adapted to receive amplified digit drive signals from the second amplifier circuit.

4,086,474
MULTIPLICATION TECHNIQUE IN A DATA PROCESSING SYSTEM

Virendra S. Negi, Pepperell, and Ming T. Miu, Chelmsford, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sep. 30, 1976, Ser. No. 728,093
Int. Cl.[2] G06F *7/54*
U.S. Cl. 364—757 20 Claims



1. Apparatus for multiplying a first number times a second number comprising:

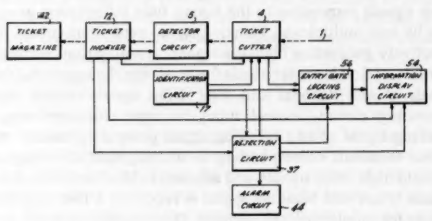
A. a first register for storing said first number, said first register having a predetermined bit position;
B. a second register;
C. means for shifting by bit the contents of said first register and said second register with the contents of said second register coupled to be shifted into said first register;
D. means, responsive to a predetermined condition, for loading said second number into said second register; and
E. enabling means, responsive to the sign of said first number and the state of a bit in said predetermined position of said first register, for either
(1) enabling said means for shifting the contents of said second register and the contents of said first register, and loading the sign of said second number into a predetermined position of said second register, or
(2) enabling said means for shifting the contents of said second register and the contents of said first register, loading the sign of said second number into said predetermined position of said second register, and adding said second number to the contents of said second register.

4,086,475

TICKET TAKING SYSTEM

William M. Churchill, 220-15 43rd Ave., Bayside, N.Y. 11361

Filed Aug. 31, 1976, Ser. No. 719,250
Int. Cl.[2] G06K *5/00*; G08G *1/14*
U.S. Cl. 235—419 **8 Claims**



1. A ticket taking system, comprising
a severable ticket-type entry item for admission to an event attended by a plurality of people, said entry item having a magnetic code indication;
detecting means for detecting the magnetic code indication of the entry item and for producing an input electric signal varying in accordance with said magnetic code indication;
identifying means having a variable predetermined code electric signal recorded therein, said identifying means being electrically connected to the detecting means and comparing the input and code signals and producing an acceptance signal when said signals are the same and a rejection signal when said signals are different;
severing means electrically connected to the identifying means for severing the entry item to provide a stub part for the holder thereof and a record part for recorded entry data on said entry item when the identifying means produces an acceptance signal; and
rejecting means electrically connected to the identifying means and to the severing means for preventing severance of the entry item and for returning the entire entry item when the identifying means produces a rejection signal.

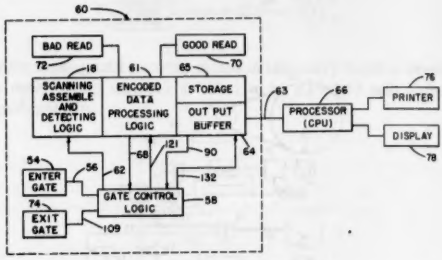
4,086,476

CONTROL CIRCUIT FOR A CODE READING DEVICE

Ronald J. King, Cambridge, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Jul. 29, 1976, Ser. No. 709,741
Int. Cl.[2] G06K *7/10*; G08C *9/06*
U.S. Cl. 235—462 **16 Claims**

1. A system for controlling the operation of a code reading device for reading data encoded indicia on a record member upon movement of the record member past the reading device, said system comprising:
(a) a first detecting means positioned upstream of the code reading device for generating a first signal upon detecting the presence of a record member, said first signal initiating the operation of said code reading device;
(b) means responsive to the operation of the reading device for generating a second signal indicating the validity of the indicia read by the code reading device;



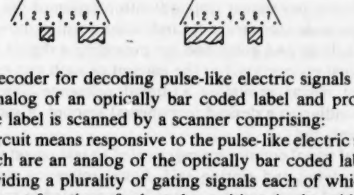
(c) a second detecting means positioned downstream of the code reading device for generating a third signal upon detecting the presence of a record member;
(d) and logic means responsive to said first, second and third signals for determining the validity of said read operation including means actuated by said first signal for disabling said logic means after a predetermined time has elapsed thereby limiting the time said second and third signals are to be used in determining the validity of said read operation.

4,086,477

DECODING METHOD AND CIRCUIT

Robert Lewis Cowardin, Cary, and George Joseph Laurer, Raleigh, both of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 27, 1977, Ser. No. 809,966
Int. Cl.[2] G06K *7/10, 9/04*
U.S. Cl. 235—464 **7 Claims**



4. A decoder for decoding pulse-like electric signals which are an analog of an optically bar coded label and produced when the label is scanned by a scanner comprising:
first circuit means responsive to the pulse-like electric signals which are an analog of the optically bar coded label for providing a plurality of gating signals each of which is a different function of selected transitions in the said pulse-like signals;
second circuit means for generating and providing a plurality of pulse-like signal trains each at different frequencies;
third circuit means responsive to said first and second circuit means for counting selected pulses included in the pulse trains under control of the said gates;
fourth circuit means for comparing in a predetermined sequence the counts attained under control of the said gates to determine the relative magnitude of the compared counts and for providing a first output signal when the

relative magnitude of the compared counts have one relationship and second output signal when the relative magnitudes of the compared counts have an opposite relationship; and,

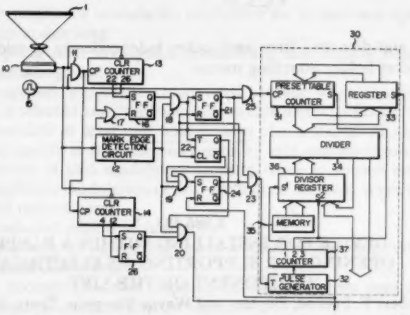
decoder means responsive to the said first and second output signals from the said fourth circuit means for providing a binary coded output indicative of the information represented in the pulse-like signal which is an analog of the optical bar coded label.

4,086,478

MARK POSITION DETECTING APPARATUS

Michiaki Okano, Kawasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Dec. 14, 1976, Ser. No. 750,370
Claims priority, application Japan, Dec. 15, 1975, 50-149326
Int. Cl.[2] G06K *7/10*
U.S. Cl. 235—466 **9 Claims**



1. A mark position detecting apparatus comprising a pattern signal generating circuit for producing a pattern signal corresponding to a pattern region upon scanning of the pattern region which includes first and second reference marks and a mark region arranged between the first and second reference marks and divided into a plurality of mark columns having the same width at least one of which contains a mark; first means for detecting the length of the mark region from the pattern signal; second means for detecting the distance between one end of the mark region to the mark; and the third means for dividing the count data from said first means which represents the length of the mark region by the number of the mark columns thereby to generate a count data which represents the mark column width and for dividing the count data from said second means which represents the distance between said end of the mark region and the mark by the count data which represents the mark column width thereby to generate a count data which represents the position of the mark column containing the mark.

4,086,479

REMOVABLE LAMP DEVICE

John W. Andrew, 695 SW. Rustic Cir., Stuart, Fla. 33494

Filed Nov. 2, 1976, Ser. No. 738,093
Int. Cl.[2] B60Q *1/30;* **F21V** *21/08;* **H01R** *13/54*
U.S. Cl. 362—432 **5 Claims**

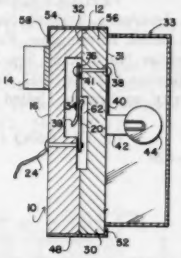
1. A removable lamp device for use on a vehicle having a lamp circuit such as a boat trailer or the like, said device comprising:

a. a base having a first planar surface and including means for mounting the base to the vehicle with the first planar surface facing outwardly therefrom, a plurality of first substantially planar resilient slide contacts each connectable to one conductor from the vehicle lamp circuit and means connecting the contacts to said base to position the first contacts in a plane parallel to and spaced from said first planar surface;

b. a lamp holder having a second planar surface and comprising a plurality of second substantially planar resilient slide contacts, means connecting the second contacts to said second surface to dispose same in a plane parallel thereto and spaced therefrom wherein the second slide contacts are slidably engagable with said first slide contacts and a lamp assembly connected to said holder opposite said first surface and having lamp wires each connected to one second contact;

c. means disposed on said base and said holder for releasably connecting the two upon engagement of the first and second slide contacts; and

d. wherein the slide contacts are rectangular and the means



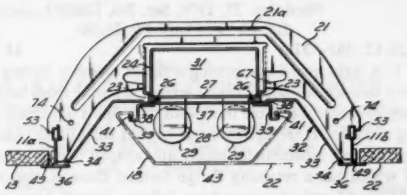
connecting each contact to its respective surface includes a post having one end through one end of the contact and a spacing member between the contact and its associated surface, wherein the vehicle lamp circuit conductors and the lamp wires are each connected to the other end pf the posts, the other end of each contact being arced outwardly from its associated surface, and wherein the base and the holder have substantially rectangular cross sections and wherein the means releasably connecting same comprise a first L-shaped member connected along a portion of the base corresponding to the bottom thereof when mounted with the leg of the L-shaped member extending upwardly, and a second L-shaped member connected along a portion of the holder corresponding to the top thereof with the leg of the second L-shaped member extending downwardly.

4,086,480

SUSPENSION CEILING AND RECESSED LIGHTING SYSTEM

Albert H. Lahm, Lorain, Ohio, assignor to Donn Products, Inc., Westlake, Ohio

Filed Sep. 24, 1976, Ser. No. 726,160
Int. Cl.[2] F21S *00/00*
U.S. Cl. 362—148 **20 Claims**



1. A recessed lighting system comprising a planar grid defining an elongated lighting opening, said grid including parallel runs of inverted tee members along opposite sides of said opening providing flanges extending inwardly along opposite sides of said opening, a plurality of arched bridging members

extending across said opening and locked at their ends to said tee members of said runs, said bridging members operating to maintain a predetermined spacing between said runs, an elongated channel supported by said bridging member above the plane of said grid and providing support for lights and a raceway for wiring, and an elongated unitary reflector extending across said opening and providing opposite edges extending over and resting on said flanges and covering said raceway, said parallel runs along opposite sides of said opening providing the framing of said lighting fixture and in cooperation with said reflector providing the finished enclosure of the sides of said lighting system.

4,086,481

VEHICLE LAMPS

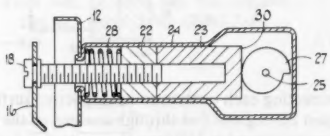
Jeremy Mark Jenkinson, Solihull, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 618,160, Sep. 30, 1975, abandoned. This application Feb. 18, 1977, Ser. No. 769,961

Claims priority, application United Kingdom, Oct. 16, 1974, 44791/74

Int. Cl.[2] B60Q *1/06*

U.S. Cl. 362—428 **1 Claim**



1. A lamp comprising:

a support member for securing to a vehicle;

a lamp unit; and

securing means for adjustably securing said lamp unit to said support member, said securing means comprising a nut and screw assembly for providing a fine adjustment of said lamp unit relative to said support member, a rotatable cam means, carried by said support member and bearing against a part of said assembly, for providing a coarse adjustment of said lamp unit relative to said support member and for adjustably preventing movement of said lamp unit towards said support member, and resilient means for urging said part of said assembly away from said support member and for urging said lamp unit towards said support member.

4,086,482

NONCONDUCTIVE LIGHT GUARD

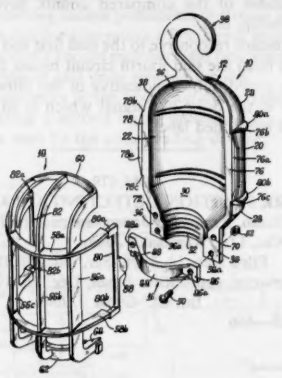
Duane E. Torgerson, Oswego, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Sep. 27, 1976, Ser. No. 726,992

Int. Cl.[2] F21V *15/00, 21/00*

U.S. Cl. 362—376 **11 Claims**

1. A light guard comprising a shield member having a concave interior surface, a cage member separate from said shield member but cooperable therewith to define a light bulb receiving chamber therebetween, one of said shield and cage members having substantially identically shaped lateral edges each of which has a retaining flange formed thereon, the other of said shield and cage members defining lateral edges each of which has latching rod means formed thereon adapted for lateral spreading therebetween sufficiently to facilitate snap-action attachment to said retaining flanges for releasably securing said shield and cage members in attached relation to define said bulb receiving chamber, and means for releasably attaching at least one of said shield and cage members to a light socket holder independent of the other of said shield and cage members so that said shield and cage members may be attached



to and detached from each other independently of said light socket holder attaching means.

4,086,483

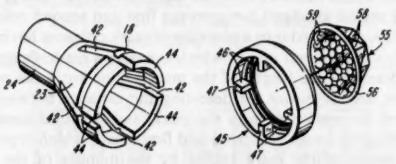
DEVICE FOR INSTALLING WITHIN A PANEL OPENING FOR SUPPORTING AN ELECTRICAL COMPONENT OR THE LIKE

Robert F. Freund, Dayton, and Wayne Sturgeon, Xenia, both of Ohio, assignors to Freund Precision, Inc., Dayton, Ohio

Filed Dec. 9, 1976, Ser. No. 748,949

Int. Cl.[2] B60Q *3/04;* **F21V** *17/00*

U.S. Cl. 362—311 **13 Claims**

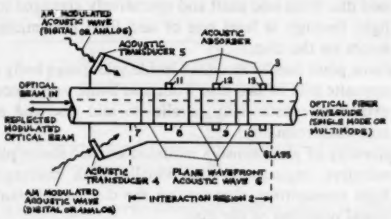


1. In a device adapted to be installed within an opening in a panel for supporting an electrical component or the like, said device including a hollow housing adapted to extend through the opening, said housing having an annular forward end portion projecting forwardly of the panel and an annular rearward end portion projecting rearwardly from the panel, means defining a peripherally extending external groove within said housing between said forward and rearward end portions for receiving the panel, means defining a slot within said housing and extending rearwardly through said forward end portion and interrupting said groove, said slot providing for partially collapsing said forward end portion of said housing or inserting said housing into the opening until the panel seats within said groove, the improvement comprising a retaining member mounted on said forward end portion of said housing and including an annular portion surrounding said forward end portion and covering said slot, a rib projecting inwardly from said annular portion of said retaining member into said slot, and said rib is effective to prevent collapsing of said forward end portion of said housing after said groove receives the panel and to effect a positive locking of said housing to the panel.

4,086,484
OPTICAL AMPLITUDE MODULATION MODULATOR

Peter Dennis Steensma, Midland Park, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jul. 14, 1976, Ser. No. 705,217
Int. Cl.[2] H04B 9/00
U.S. Cl. 250—199 19 Claims


AM MODULATED ACOUSTIC WAVE (DIGITAL OR ANALOG)
ACOUSTIC TRANSDUCER 5
ACOUSTIC ABSORBER
OPTICAL BEAM IN
REFLECTED MODULATED OPTICAL BEAM
OPTICAL FIBER WAVEGUIDE (SINGLE MODE OR MULTIMODE)
GLASS
ACOUSTIC TRANSDUCER 4
PLANE WAVEFRONT ACOUSTIC WAVE 6
AM MODULATED ACOUSTIC WAVE (DIGITAL OR ANALOG)
INTERACTION REGION 2

1. An amplitude modulation modulator for at least one optical beam comprising:

an optical fiber waveguide transmitting said optical beam therealong; and

an amplitude modulation modulated acoustic wave coupled to a selected region of said waveguide along its length to modulate at least one transmission characteristic of said waveguide in said selected region by said amplitude modulation of said modulated acoustic wave to impart said amplitude modulation of said modulated acoustic wave to said optical beam;

said selected region including

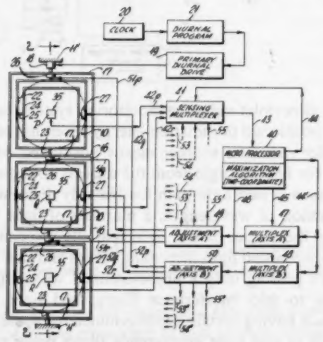
a plurality of shorter regions in a series relationship with each other, and

an acoustic absorber disposed between adjacent ones of said plurality of shorter regions.

4,086,485
SOLAR-RADIATION COLLECTION APPARATUS WITH TRACKING CIRCUITRY

Roy Kaplow, Newton, and Robert I. Frank, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 26, 1976, Ser. No. 690,093
Int. Cl.[2] G01J 1/20
U.S. Cl. 250—203 R 10 Claims

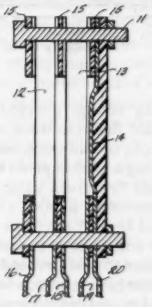


1. Solar-radiation collection apparatus, comprising frame structure adapted for fixed mounting, a first gimbal frame pivotally mounted to said fixed frame structure and predicted-drive means for imparting predicted diurnal rotation to said gimbal frame with respect to said fixed frame, a plurality of spaced radiation-collecting optical systems each having a two-axis gimbal suspension with respect to a different spaced location on said first gimbal frame, separate correctional-drive means associated with each of the axes of each of said two-axis gimbal suspensions, a radiationresponsive cell independently carried by each gimbal suspension and aligned with the optical axis of the collecting system associated therewith, microprocessor means for evaluating the output of a given cell and for generating two-component output signals for correctional application to the respective correctional drive means of said given cell, whereby to use the output of the given cell to correctionally drive its gimbal system in approach to optimal alignment with the sun, first multiplexing means sequentially and periodically associating the respective cell outputs with said microprocessor means, and second multiplexing means sequentially and periodically associating with the output signals of said microprocessor means the separate correctional-drive means for the gimbal suspensions of the respective cells.

4,086,486
ONE DIMENSIONAL PHOTON-COUNTING DETECTOR ARRAY

Richard Lee Bybee, 955 McIntire, Boulder, Colo. 80303, and John G. Timothy, 85 E. India Row, Boston, Mass. 02110

Filed Jun. 8, 1976, Ser. No. 693,954
Int. Cl.[2] H01J 39/12
U.S. Cl. 250—207 5 Claims



1. A one-dimensional photon-counting detector for operation at extreme ultraviolet and soft X-ray wavelengths comprising at least one microchannel array plate configured to minimize ion feedback, an anode array comprising a plurality of separate anode elements disposed in a plane parallel and adjacent to but spaced a predetermined distance on the order of 25 μm from the innermost face of said at least one microchannel array plate, amplifier and discriminator means connected to each anode element for developing output pulses indicative of a charge packet accumulated by the anode element, integration means for accumulating a count representative of the number of output pulses from each anode element during a selected predetermined time interval, and data readout means for reading out the count of output pulses for each anode element.

4,086,487
COPLANAR DYNODE ELECTRON MULTIPLIER

Charles Bruce Johnson, Fort Wayne, Ind., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Sep. 30, 1976, Ser. No. 728,493
Int. Cl.[2] H01J 39/12
U.S. Cl. 250—207 38 Claims

1. A coplanar dynode electron multiplier comprising:

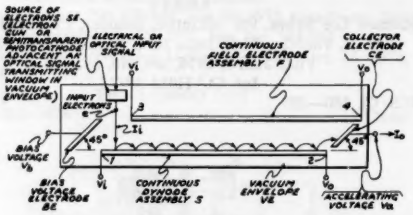
a vacuum envelope having a longitudinal axis;

a dynode assembly having a given length disposed in said envelope in a first plane disposed parallel to and in a transverse spaced relation in one direction from said axis, said dynode assembly having an input end and an output end, said dynode assembly receiving input electrons adja-

cent said input end thereof, said input electrons having an input current with a magnitude directly proportional to the magnitude of an input signal;

a field electrode assembly having said given length disposed in said envelope in a second plane disposed parallel to and in a transverse spaced relation in the other direction from said axis, said field electrode assembly having an input end adjacent said input end of said dynode assembly and an output end adjacent said output end of said field electrode assembly, said field electrode assembly being shifted along said axis with respect to said dynode assembly such that said output end of said field electrode assembly extends beyond said output end of said dynode assembly a given amount;

a first operating voltage coupled to both said dynode assembly and field electrode assembly adjacent said input end of both of said assemblies;


SOURCE OF ELECTRONS SE (ELECTRON GUN OR SEMITRANSPARENT PHOTOCATHODE ADJACENT AN OPTICAL SIGNAL TRANSMITTING WINDOW IN VACUUM ENVELOPE)
ELECTRICAL OR OPTICAL INPUT SIGNAL
CONTINUOUS FIELD ELECTRODE ASSEMBLY F
COLLECTOR ELECTRODE CE
INPUT ELECTRONS
BIAS VOLTAGE Vb
BIAS VOLTAGE ELECTRODE BE
CONTINUOUS DYNODE ASSEMBLY S
VACUUM ENVELOPE VE
ACCELERATING VOLTAGE Va

a second operating voltage coupled to both said dynode assembly and said field electrode assembly adjacent said output end of both of said assemblies, said second operating voltage having a second given value greater and more positive than said first given value;

a bias voltage electrode having a bias voltage coupled thereto disposed in said envelope spaced longitudinally from said input end of both of said assemblies at a given angle with respect to said first and second planes; and

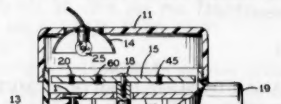
a collector electrode having an accelerating voltage coupled thereto disposed in said envelope adjacent said output end of both of said assemblies at said given angle with respect to said first and second planes, said collector electrode providing a multiplied output current for said multiplier, said output current being directly proportional to an amplified version of said input signal.

4,086,488

DIGITAL PRESSURE GAUGE SYSTEM

James J. Hill, North Miami, Fla., assignor to General Medical Appliance Research Corporation, Miami, Fla.

Filed Oct. 18, 1976, Ser. No. 733,284
Int. Cl.[2] G01D *5/34*
U.S. Cl. 250—231 P **9 Claims**



1. In a pressure gauge system comprising pressure gauge having:

a gauge body with a gas pressure inlet;

a cover on said gauge body;

a rotary shaft in said gauge body extending at one end toward said cover;

and pressure responsive means in said gauge body for rotating said shaft proportional to the gas pressure at said inlet; the improvement which comprises:

an encoder disc fastened to the shaft at said end and extending substantially perpendicular thereto, said disc carrying a plurality of discrete light transmitting elements at different positions radially and circumferentially of the disc;

a lamp positioned inside said cover on the opposite side of said disc from said shaft and operatively arranged to shine light through at least one of said light transmitting elements on the disc;

a stator plate fixedly mounted inside said gauge body on the opposite side of said disc from said lamp, said stator plate extending substantially parallel to said disc and passing said shaft rotatably;

a plurality of photosensors mounted on said stator plate for selective registration individually with corresponding light transmitting elements on the disc in different rotational positions of the disc;

numerical display means for displaying a three digit decimal number;

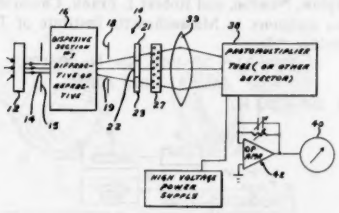
and circuit means operatively connected between said photosensors and said numerical display means for converting the optically sensed rotational position of the shaft into the two most significant digits of the displayed three digit number.

4,086,489

ULTRA VIOLET RADIATION PERSONNEL HAZARD METER

Harley V. Piltingsrud, 3431 Whitfield Ave., Cincinnati, Ohio 45220

Filed Feb. 4, 1977, Ser. No. 765,712
Int. Cl.[2] G01J *1/42*
U.S. Cl. 250—372 **5 Claims**



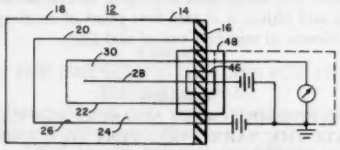
1. An ultraviolet radiation monitoring system, comprising: a diffuser positioned in radiation energy receiving relation to an ultraviolet radiation source; means positioned adjacent said diffuser for limiting light from the diffuser to a predetermined path; means in said light path for spatially dispersing the light as a function of wavelength, a plurality of light interference filters, in the output of said light spatially dispersing means; a mask between said light dispersing means and said interference filters for passing only a predetermined wavelength band of radiation to said interference filters; said light interference filters each having certain predetermined bandpass characteristics; each of said light interference filters being positioned to receive certain predetermined wavelengths corresponding to the band pass characteristics of the filters; a photodetector in energy receiving relation to said bandpass interference filters; means positioned between said interference filters and said photodetector to selectively adjust the transfer function of the various radiation wavelength bands to desired values; means connected to the output of said photodetector for indicating the ultraviolet radiation corresponding to the desired wavelengths.

4,086,490

WIDE RANGE NEUTRON DETECTION SYSTEM

William H. Todt, Sr., Elmira Heights, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jul. 7, 1976, Ser. No. 703,156
Int. Cl.[2] G01T 1/18, 3/00
U.S. Cl. 250—385 7 Claims



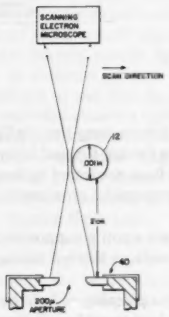
1. A wide range neutron detection system which is operable over the neutron flux range of 1 to 10^{10} neutrons per square centimeter per second in which a fission type ionization chamber neutron detector is gamma compensated and includes means for minimizing the effects of alpha signals generated in the detector, and means for operating the neutron detector in the pulse counting mode for low neutron flux levels and in the direct current mode for high neutron flux levels.

4,086,491

DIRECT MEASUREMENT OF THE ELECTRON BEAM OF A SCANNING ELECTRON MICROSCOPE

William H. Vaughan, College Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 4, 1977, Ser. No. 771,715
Int. Cl.[2] G01N 27/00
U.S. Cl. 250—397 17 Claims



1. Apparatus for obtaining a relative measurement of the electron beam diameter of a scanning electron microscope comprising:

current source means for generating electrical current;

heated wire means connected to said current source means, for acting as a knife edge to cause a change in the current density of said electron beam as it is scanned across said knife edge;

support means for supporting said heated wire means;

electron collector means for receiving said electron beam after it has passed said knife edge; and

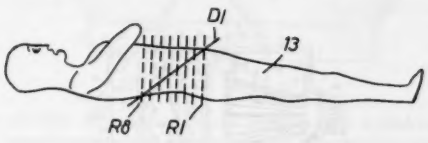
display means receiving the output of said electron collector for utilizing said received changing current density of said electron beam to display a relative measurement of said electron beam diameter.

4,086,492

DISPLAY APPARATUS FOR USE IN RADIOGRAPHY

James Alec Lodge, Maidenhead, and John James Jarrett, Chalfont St. Peter, both of England, assignors to EMI Limited, England

Filed Jan. 7, 1977, Ser. No. 757,507
Claims priority, application United Kingdom, Jan. 21, 1976, 2264/76
Int. Cl.[2] A61B 6/02; H05G 1/30
U.S. Cl. 250—416 TV 6 Claims



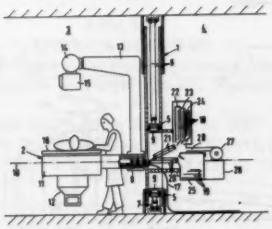
1. A display processing apparatus, for cooperating with X-ray apparatus providing data signals representing the distribution of absorption of x-radiation in each of a plurality of substantially parallel spaced planar sections of a body, the data signals for each section forming a frame of one or more fields of scanned lines; the display processing apparatus including storage means for storing the data signals of each frame, means for deriving from the storage means data signals forming a composite frame, of one or more fields of scanned lines, representing the distribution of the absorption of the radiation in a further planar section intersecting at least some of the first mentioned sections, said composite frame being formed from lines or parts of lines relating to parts of the body in the intersected first mentioned sections and within a predetermined distance of the plane of the further section, a source of one or both of line or frame frequency saw-tooth waveforms and switch control means, responsive to said one or both of line or frame frequency sawtooth waveforms, providing switching pulses each suitable for causing the means for deriving to derive data from a different frame or line in a predetermined sequence.

4,086,493

X-RAY EXAMINATION APPARATUS

Guenter Krumrey, Weisendorf, and Wilhelm Stöeckl, Fuerth-Sack, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 10, 1977, Ser. No. 776,264
Claims priority, application Germany, Mar. 26, 1976, 2612987
Int. Cl.[2] G03B 41/16
U.S. Cl. 250—468 5 Claims



1. In an X-ray examination apparatus having at least one magazine for unpacked and unexposed X-ray film material, means for transporting the film from the magazine to an exposure station, said means for transporting including a housing, said magazine and the housing for the means for transporting being sealed so as to be impervious to light, the improvement comprising means for regulating the humidity of the air in the

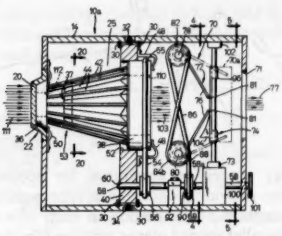
means for transporting, said means including a blower having a connection to said housing.

4,086,494

RADIATION COLLIMATOR FOR USE WITH HIGH ENERGY RADIATION BEAMS

Stephen P. Malak, 1720 N. Prospect Ave., Milwaukee, Wis. 53202

Filed Dec. 17, 1976, Ser. No. 751,700
Int. Cl.² G21F *5/04*
U.S. Cl. 250—505 **30 Claims**



8. A radiation collimator for collimating a beam of radiation, comprising:

a housing having passage means permitting passage of a beam of radiation directed toward the housing;

support means mounted in the housing to intercept the beam of radiation and defining a support space permitting passage of the beam of radiation therethrough;

a plurality of support rods mounted on the support means and within the support space and about the beam of radiation passing through the collimator;

a first set of longitudinally extending leaves of radiation absorbing material, one each secured to a portion of one of the support rods, the leaves being in close overlapping relation to effectively define a first hollow cone about the beam of radiation; and

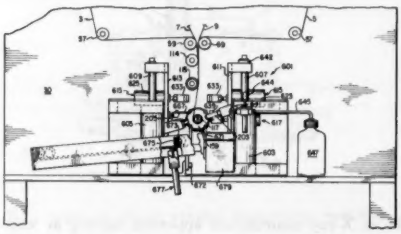
a second set of longitudinally extending leaves of radiation absorbing material, one each secured to a remaining portion of one of each of the support rods, the leaves being in close overlapping relation to effectively define a second hollow cone about the radiation beam.

4,086,495

AUTOMATIC CAPACITOR WINDING MACHINE

Fredric S. Miller, Wayne, N.J., assignor to Universal Manufacturing Corporation, Bridgeport, Conn.

Division of Ser. No. 562,011, Mar. 25, 1975, Pat. No. 4,020,727.
This application Jan. 11, 1977, Ser. No. 758,531
Int. Cl.² G01N *21/30*
U.S. Cl. 250—561 **4 Claims**



1. A photoelectric device for sensing when an object which travels a predefined path and which crosses a line a plurality of times is at a first point of crossing on the path which is nearest a first end of said line comprising:

a light detector having a relatively narrow angle of light acceptance located proximate said first end of said line and responsive to light impinging thereon; and

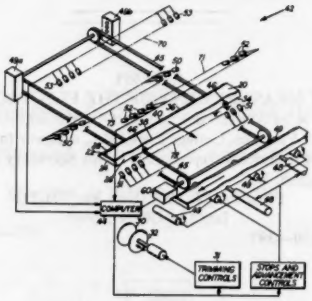
a light source proximate the second end of said line for transmitting a beam of light, which is wider at a point of corssing on the path which is further from said first end of the line than said first point of crossing than the widest portion of the object, along said line, whereby said object prevents said beam from impinging on the detector only when said object is at said first point of crossing on the path closest to said first end of said line.

4,086,496

METHOD FOR OPTICALLY MEASURING A CANT TO LOCATE THE NARROWEST FLAT SIDE AND ITS BOUNDARIES AND MANUFACTURING LUMBER THEREFROM

Larry R. Berry, Roseburg, Oreg., assignor to Sun Studs, Inc., Roseburg, Oreg.

Filed Mar. 18, 1977, Ser. No. 778,860
Int. Cl.² G01N *21/30*
U.S. Cl. 250—561 **7 Claims**



5. A method for determining the configuration of an elongate cant, of the type having top and bottom substantially flat, mutually parallel surfaces separated by longitudinal wanes and having a generally trapezoidal cross section, said method comprising:

(a) placing said cant upon a supporting surface with either one of the flat surfaces thereof resting upon said supporting surface;

(b) projecting a first plurality of light beams, spaced longitudinally with respect to said cant, through said supporting surface at a first acute angle with respect to said supporting surface which is less than any acute angle formed by one of said longitudinal wanes of said cant with respect to said supporting surface;

(c) projecting a second plurality of light beams spaced longitudinally with respect to said cant in alignment with said first plurality of light beams, through said supporting surface at a second acute angle with respect to said supporting surface, said second acute angle facing oppositely to said first acute angle and being less than any acute angle formed by the second one of said longitudinal wanes of said cant with respect to said supporting surface;

(d) effecting relative motion between said cant and said first and second plurality of light beams respectively in a direction transverse to said longitudinal wanes so that the longitudinal boundaries of said respective flat surfaces

sequentially interrupt and then restore each light beam of said first and second plurality of beams;

(e) detecting the amounts of said relative motion corresponding to said respective interruptions and restorations of each light beam of said first and second plurality of light beam; and

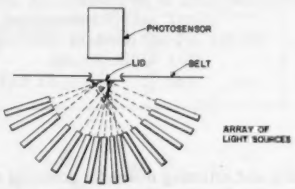
(f) determining the width and boundary locations of the narrowest width portion of said flat surfaces from said amounts of relative motion detected.

4,086,497

SYSTEM FOR INSPECTING CAN LIDS FOR THROUGH THE LID FLAWS

Russell Murray, Laurel, Md., assignor to Columbia Research Corporation, Gaithersburg, Md.

Filed Apr. 15, 1976, Ser. No. 677,471
Int. Cl.² G01N *21/32*
U.S. Cl. 250—562 **12 Claims**



1. A method for detecting light passing flaws within discrete elements, normally opaque to light, characterized by a sampling technique which enhances the signal to noise ratio by generating a composite signal from discrete samplings, comprising the steps of:

(A) conveying a normally opaque element to a point between a visible spectrum light source and a photosensitive means; and,

(B) impinging a visible spectrum light beam from said light source onto said normally opaque element at said point and simultaneously energizing said photosensitive means on the other side of said normally opaque element; and,

(C) generating a first discrete sample signal, in said photosensitive means, in response to said light impingement wherein the amplitude of said first signal is a direct function of the cross-sectional area of a light passing flaw; and

(D) generating at least one additional discrete sample signal, in said photosensitive means, in response to said light impingement wherein the amplitude of each additional signal is the same direct function of the cross-sectional area of said light passing flaw; and,

(E) amplifying and then storing the wave forms of said first and at least one additional discrete sample signals; and

(F) additively summing the wave forms of each of said stored signals to produce a composite signal which represents the addition of the amplitudes of each of said stored signals whereby only the amplitudes representing said light passing flaw in each sample signal will be constantly additive in said composite signal; and

(G) outputting said composite signal as the enhanced representation of a light passing flaw in said normally opaque element.

4,086,498

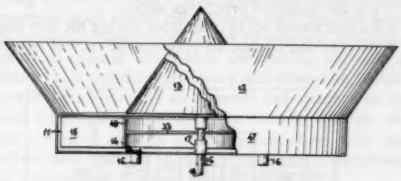
WIND POWERED ROTARY ELECTRIC GENERATOR

Joseph Szoeke, 57 Portland Pl., Yonkers, N.Y. 10703

Filed Apr. 25, 1975, Ser. No. 571,732
Int. Cl.² H02P *9/00*
U.S. Cl. 290—55 **5 Claims**

1. A wind powered rotary electric generator, comprised of a rotor having a plurality of vanes and a back planar base ring comprising a tapping means mounted on a shaft provided with an axial movement,

a wind deflecting means consisting of a conical shaped core wind deflector, its base circumference encompasing the inner circumference of said vanes and a peripheral wind deflector encircling said rotor at its outer peripheral circumference,



a plurality of generators, each comprising a cylindrical shaped tapping head adapted to be driven by said base ring tapping means and an electrical generator, attached to a mounting means through a spring biased generator holding means, and,

operating means, to engage and disengage said electrical generating means and said tapping by reciprocating movement of said rotor and tapping means.

4,086,499

STABLE ELECTRETS OF STYRENE-TYPE POLYMERS

Anupama Mishra, Guelph, Canada, assignor to Uniroyal Ltd., Canada

Filed Nov. 26, 1976, Ser. No. 745,256
Int. Cl.² H01B *3/44*
U.S. Cl. 307—88 ET **9 Claims**

8. A charged electret consisting of an electrostatically polarized, resinous, thermoplastic emulsion-polymerized styrene-type polymer selected from the group consisting of

(i) homopolymers of styrene, vinyltoluene or t-butylstyrene, and

(ii) copolymers of at least two of the said monomers,

said polymer having a volume resistivity of at least 10^{16} ohm-cm, and a glass transition temperature above 50° C., and containing not more than 1% by weight of electron-donor impurities and not more than 0.5% by weight of electron-acceptor impurities, said electret being characterized by the ability to retain at least 75% of its original charge upon exposure to a temperature of 50° C at a relative humidity of 100% for 100 days.

9. A method of making the electret of claim 8 comprising sandwiching the said styrene-type polymer between two glass plates and applying a DC voltage of about 20 to 60 KV for 1 to 5 minutes.

4,086,500

ADDRESS DECODER

Yasoji Suzuki, Kanagawa, and Ochii Kiyofumi, Koganeishi, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Dec. 6, 1976, Ser. No. 747,975
Claims priority, application Japan, Dec. 5, 1975, 50-143908
Int. Cl.² G11C *8/00*; H03K *19/08, 19/20, 17/04*
U.S. Cl. 307—270 **5 Claims**

1. An address decoder comprising:

a chip enable signal line;

a complementary chip enable signal line;

a common precharge node;

a decoder output node;

a first power source;

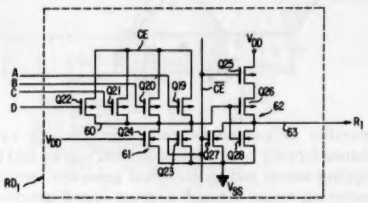
a second power source;

a plurality of switching MOS transistors each having a first conductivity type and a decoder input, the channels of

which are connected in parallel between the chip enable signal line and the common precharge node;

first and second MOS transistors having a second conductivity type and connected between the common precharge node and the first power source in parallel, the first MOS transistor being for use as a load transistor and the gate electrode of the second MOS transistor being connected to the complementary chip enable signal line for precharging the common precharge node;

third and fourth MOS transistors having the first conductivity type and connected between the second power source



and the decoder output node in series, the gate electrode of the third transistor being connected to the complementary chip enable line, the gate electrode of the fourth MOS transistor being connected to the common precharge node; and

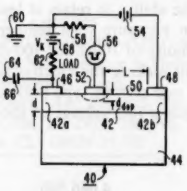
fifth and sixth MOS transistors having the second conductivity type and connected between the decoder output node and the first power source in parallel, the gate electrode of the fifth MOS transistor being connected to the complementary chip enable signal line and the gate electrode of the sixth MOS transistor being connected to the common precharge node.

4,086,501

PLANAR TRANSFERRED ELECTRON LOGIC DEVICE WITH IMPROVED BIASING MEANS

Lakshminarasimha Chainulu Upadhyayula, East Windsor, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1976, Ser. No. 750,400
Int. Cl.² H01L *27/04;* H03K *3/26*
U.S. Cl. 307—299 R **4 Claims**



1. In a semiconductor planar transferred electron device of the type having predetermined levels of trigger sensitivity and stability and comprising a substrate of substantially insulating material, a relatively thin layer of a semiconductor material which exhibits a differential negative resistance through the transferred electron effect characterized by a transfer of electrons from a high to a low mobility sub-band and the formation of domains upon the application of an electric field above threshold, spaced anode and cathode terminals engaging said semiconductor layer, a gate terminal on said semiconductor layer, means for applying across said anode and cathode terminals a first potential having a magnitude below said threshold value, said first potential creating a reverse bias on said gate terminal, means for applying an input trigger signal of a predetermined magnitude and polarity to said gate terminal, said input trigger signal increasing the electric field of said first potential to exceed said threshold value causing thereby the formation of said domains, a load resistor serially connected to said cathode terminal to provide a device output pulse having the same polarity as said input trigger signal, wherein the improvement comprises:

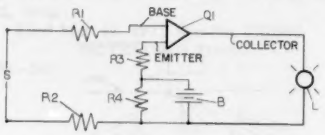
means for biasing said cathode terminal to reduce the magnitude of said reverse bias on said gate terminal thereby reducing the magnitude of said input trigger signal and enhancing the trigger sensitivity and stability of said device, said reduced input trigger signal being sufficient to combine with said first potential to form said domains.

4,086,502

SENSING CIRCUIT

Leslie J. Toth, Toledo, Ohio, assignor to Botelco, Toledo, Ohio

Filed Nov. 11, 1976, Ser. No. 740,867
Int. Cl.² H03K *17/00*
U.S. Cl. 307—308 **9 Claims**



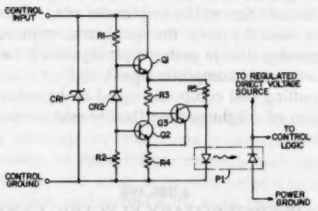
1. Sensing and actuating means for actuating an electrically-operated device when receiving a signal of a given magnitude from a variable sensor, said sensing and actuating means comprising an electrically-operated device, a source of DC power, a first conductor connecting one side of said source to the sensor, a first resistor connected in series between said source and said sensor, a silicon transistor, a second conductor connecting the other side of said source and the emitter of said transistor, a second resistor connected in series between said source and the emitter of said transistor, a third resistor connected to said first conductor and said second conductor across said source, a third conductor connecting said sensor and the base of said transistor, a fourth conductor connecting the collector of said transistor and said electrically-operated device, and a fifth conductor connecting said electrically-operated device and said one side of said source.

4,086,503

CONTROL CIRCUIT INITIATING CONDUCTION OF AN OPTO-ISOLATOR UNIT

David A. Fox, Shawnee Township, Allen County, and Otto L. Apfelbeck, Fort Shawnee, both of Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jun. 21, 1976, Ser. No. 698,253
Int. Cl.² H03K *5/20, 5/08*
U.S. Cl. 307—363 **3 Claims**



1. An electronic control circuit comprising:

a pair of input terminals for receiving a voltage signal;

means responsive to voltage to produce a given response;

means for keeping said voltage signal at said input terminals from appearing across said voltage responsive means unless said voltage signal is at least of a predetermined

magnitude, said means comprising a voltage limiting device arranged to prevent application of said voltage, below said predetermined magnitude, to said responsive means, and said voltage limiting device causing current produced by said signal to flow in a first path shunting said responsive means so long as said signal is below said predetermined magnitude and said voltage limiting device becoming conductive and causing current produced by said signal to flow in a second path to said responsive means when said signal is at least of said predetermined magnitude; and

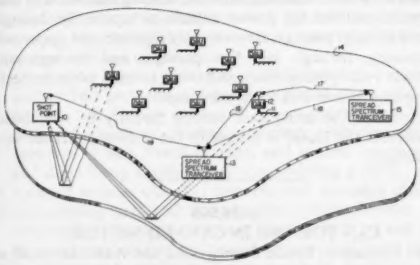
means for maintaining said voltage responsive means at a substantially constant current flow when said voltage signal is at least of said predetermined magnitude.

4,086,504

DISTRIBUTED DATA ACQUISITION

George D. Ezell; Marvin L. Murphy, Jr., both of Dallas, and Paul D. Davis, Jr., Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 29, 1973, Ser. No. 410,938
Int. Cl.² G01V *1/22*
U.S. Cl. 340—15.5 TS **7 Claims**



1. In data gathering operations the combination of:

data acquisition units at each of a plurality of source stations in an area,

a master station spaced from said units,

a slave station spaced from said units and from said master station,

means to transmit from said master station spread spectrum channel sync pulses,

means at all said unit to receive and compress said sync pulses,

means responsive to compressed pulses to initiate generation of a sample pulse train having a true first bit,

means at said slave station responsive to said sync pulses to store a time lapse signal representative of time lapse between receipt at said slave station of one said sync pulse from said master station and said true bit from said data acquisition unit, and

means at said slave station responsive to a predetermined sync pulse from said master station to transmit to said master station said time delay signal.

4,086,505

ELECTROMAGNETIC SYSTEM

James A. McDonald, 27208 Walker, Warren, Mich. 48092

Filed Aug. 11, 1975, Ser. No. 603,596
Int. Cl.² H02K *7/02*
U.S. Cl. 310—74 **1 Claim**

1. An electromagnetic motor comprising:

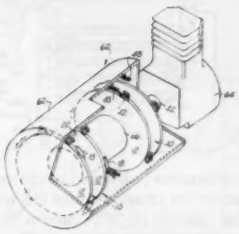
a first flywheel mounted on a shaft for rotation about an axis;

a plurality of armatures spaced at 90° intervals, each armature being of a material having magnetic properties, said armatures being attached to the periphery of said flywheel and rotatable therewith, each of said armatures having a cylindrically shaped mid-section and conically shaped end sections, the apexes of which point in opposite directions;

a plurality of stationary coils radially spaced from said rotating flywheel and through which an electric current is passed for generating a magnetic field to attract said armatures toward said coils to rotate said flywheel, said coils being of a horseshoe shape having an interior section opening to said flywheel, said armatures being complementarily shaped to said coil interiors such that said armatures may pass through the center of said coil interiors;

a plurality of support arms, each arm having one end attached to said flywheel periphery and extending radially outward therefrom with an opposite end attached to one of said armatures, said arms being sized to maintain said armatures in a radially spaced relationship with said flywheel such that said armatures may pass through said coils without said flywheel engaging said coils;

a second flywheel axially spaced from said first flywheel and mounted for rotation on said shaft on an axis common to the axis of rotation of said first flywheel and rotatable with said first flywheel;



a plurality of second armatures, each second armature being of a material having magnetic properties, said armatures being of a semi-circular shape and attached to the periphery of said flywheel and rotatable therewith, to open portion of said semi-circular shaped armatures facing radially outward;

a plurality of second stationary coils radially spaced from said rotating flywheel and through which an electric current is passed for generating a magnetic field to attract said second armatures toward said second coils to rotate said second flywheel, said second coils being of a cylindrical shape having an exterior surface shape complementary to the interior shape of said semi-circularly shaped second coils such that said second coils may pass through the center of said semi-circularly shaped armatures; and

an electric motor coupled to said shaft for rotating said flywheels to a predetermined velocity, the action of the magnetic fields generated by said coils on said armatures maintaining said flywheels at said predetermined velocity.

4,086,506

CONTRA-ROTATING HOMOPOLAR MOTOR-GENERATOR FOR ENERGY STORAGE AND RETURN

Robert L. Kustom, Palos Heights, and Robert B. Wehrle, Downers Grove, both of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 5, 1976, Ser. No. 711,903
Int. Cl.² H02K *7/02*
U.S. Cl. 310—74 **4 Claims**

1. An apparatus for receiving electrical energy, storing the energy as rotational mechanical energy, and delivering the stored energy to a load as electrical energy, the apparatus comprising:

a. a plurality of electrically conducting nested coaxial concentric cylindrical shells;

b. a plurality of electrically insulating cylindrical shells

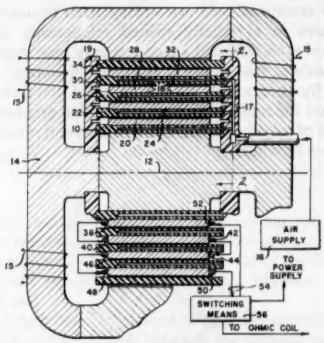
coaxial and concentric with each other and with the conducting shells and disposed to insulate the conducting shells from each other;

c. an electromagnet disposed to produce a magnetic flux that is directed radially through the conducting shells;

d. a plurality of air bearings disposed to support the conducting shells in rotation about an axis;

e. an air supply connected to the air bearings to supply air flow therethrough;

f. a plurality of spokes connected to the electromagnet and to the insulating cylindrical shells to maintain the insulating shells in fixed irrotational engagement;



g. a plurality of brushes connected to the conducting shells at edges thereof to create a series electric circuit therethrough that carries electric current in opposite axial directions in adjacent conducting shells;

h. a first terminal connected to one of the brushes that is connected to an innermost conducting shell; and

i. a second terminal connected to one of the brushes that is connected to an outermost conducting shell to form a series circuit through the conducting shells and brushes to the first terminal, whereby electrical energy that is supplied to the first and second terminals is stored as rotational mechanical energy in the conducting cylinders for delivery as electrical energy to a load.

4,086,507

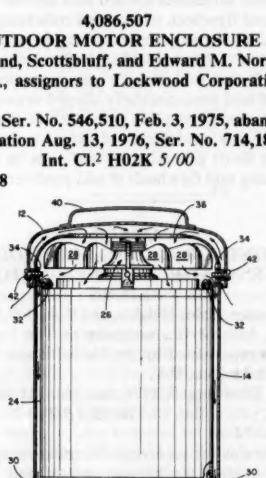
OUTDOOR MOTOR ENCLOSURE

Murray C. Roland, Scottsbluff, and Edward M. Norum, Gering, both of Nebr., assignors to Lockwood Corporation, Gering, Nebr.

Continuation of Ser. No. 546,510, Feb. 3, 1975, abandoned. This application Aug. 13, 1976, Ser. No. 714,185

Int. Cl.[2] H02K *5/00*

U.S. Cl. 310—88 **7 Claims**



1. An attachment to a vertically disposed, sealed electric motor unit of the outdoor type for protecting the motor unit from rain, said motor unit including a generally cylindrical housing surrounding a motor and further including a cooling fan mounted external to the housing for rotation with the drive shaft of the motor to thereby force a flow of cooling air along the outer surface of said housing, said attachment comprising:

a. a generally cylindrical moisture shield circumferentially disposed about said housing and said fan, said shield being of a cross-sectional dimension slightly greater than that of said housing to thereby define a first passage for said flow of cooling air, said shield having lower and upper end openings to define respectively exhaust and intake openings for said passage, the upper end opening being of a cross-section of a dimension reduced from that of said housing and being defined adjacent said cooling fan;

b. means for securing said shield directly to said housing wherein the housing is primarily the only support for said shield;

c. a rain canopy having a first portion circumscribing at least a portion of said shield and having a second portion disposed transversely of said drive shaft and slightly removed from said upper end opening for covering said upper end opening, said first and second portions being spaced from said shield to provide an air inlet passage to said upper end opening, whereby during operation of said motor unit the fan draws outside air upwardly through said air inlet passage, downwardly through said upper end opening, through said first passage, and through said lower end opening along said outer surface while protecting said motor unit from rain; and

d. means for securing said canopy directly to said shield wherein the shield is primarily the only support for said canopy.

4,086,508

CAN FOR USE IN CANNED MOTOR

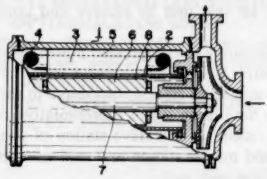
Katashi Masumoto; Ei-ichi Furubayashi, and Wahei Inoue, all of Tokyo, Japan, assignors to The Director National Research Institute for Metals and Kabushiki Kaisha Maekawa Seisakusho, both of Tokyo, Japan

Continuation of Ser. No. 590,381, Jun. 25, 1975, abandoned. This application Aug. 15, 1977, Ser. No. 824,715

Claims priority, application Japan, Jun. 29, 1974, 49-73804

Int. Cl.[2] H02K *5/10*

U.S. Cl. 310—86 **8 Claims**



1. A can for use in a canned motor wherein a cylindrical can body made of soft magnetic metal plate having a crystalline structure which is arranged to have the magnetically hard direction of the plate oriented to the circumferential direction of said cylindrical can body, said circumferential direction being perpendicular to the stator slots of said motor, said crystalline structure being such that: when the material of said metal plate has a body centered cubic crystal structure, a direction different by more than 35° from the direction of the crystal axis <**001**> is in parallel to said circumferential direction of said cylindrical can body; when said metal plate has a face centered cubic structure, a direction different by more than 35° from the direction of the crystal axis <**111**> is in parallel to said circumferential direction of said cylindrical can body; and when said metal plate has a hexagonal closepacked structure, a direction different by more than 60° from the

direction of the crystal axis <00.1> is in parallel to said circumferential direction.

4,086,509

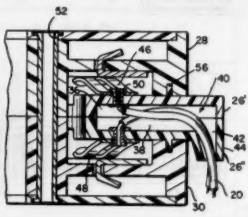
SANDWICHED SLIP RING ASSEMBLY

Harry G. Manson, Princeton, Ind., assignor to Hansen Manufacturing Company Inc., Westbury, N.Y.

Filed Sep. 3, 1976, Ser. No. 720,152

Int. Cl.[2] H01R *39/10*

U.S. Cl. 310—232 **6 Claims**



1. A slip ring assembly comprising:

a. a pair of annular rotatable disks of electrically insulative material, each of said disks having a central opening extending completely through its thickness aligned with the central opening of the other,

b. a stationary annular disk of electrically insulative material sandwiched between said pair of rotating disks, said stationary disk having a central opening extending completely through its thickness aligned with the central openings of said rotatable disks, said aligned openings in said disks being capable of accommodating a shaft,

c. a closed annular chamber between said rotatable disks,

d. cooperating electrically conductive resilient brushes and electrically conductive contact rings carried by said stationary and rotatable disks, said brushes and rings being located entirely within said closed annular chamber, and

e. electrical leads electrically connected to said brushes and rings, said leads extending to the exterior of said disks.

4,086,510

FLAT MINIATURE DYNAMOELECTRIC MACHINE

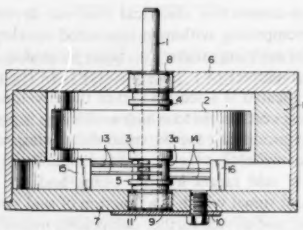
Seizo Watanabe, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Toyko, Japan

Filed Jun. 25, 1976, Ser. No. 699,616

Claims priority, application Japan, Jun. 26, 1975, 50-90682; Oct. 30, 1975, 50-148087; Nov. 21, 1975, 50-158323; Nov. 27, 1975, 50-160603; Nov. 28, 1975, 50-160673; Nov. 28, 1975, 50-160674; Dec. 8, 1975, 50-166059; Dec. 16, 1975, 50-170347; Nov. 21, 1975, 50-139904

Int. Cl.[2] H02K *13/00*

U.S. Cl. 310—242 **12 Claims**



1. A flat miniature dynamoelectric machine comprising a flat rotor having a coreless coil, a commutator integrally carrying the rotor and having an exposed portion for sliding contact, a shaft fixedly carrying the rotor and the commutator thereon, a housing including bearing means which rotatably carries the shaft, one end of the shaft projecting externally of the housing, a magnet disposed within the housing so as to establish a magnetic field for cooperation with the rotor, conductive brushes disposed within the housing for sliding contact with the exposed portion of the commutator, and a thrust bearing plate mounted on the housing for resilient abutment against the other end of the shaft, said conductive brushes comprising a Z-shaped support member of a resilient metallic material having one end fixedly mounted on the machine and having the other end defining a fork-like shape having a pair of prongs, and conducting members fixedly mounted on the respective prongs for sliding contact with the commutator.

4,086,511

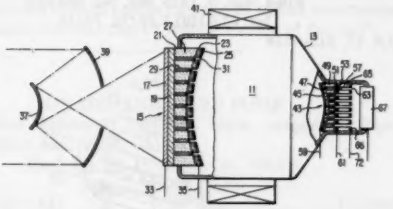
MILLIMETER IMAGING DEVICE

Charles M. Redman, Las Cruces, N. Mex., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 25, 1977, Ser. No. 781,255

Int. Cl.[2] H01J *39/18, 31/50*

U.S. Cl. 313—101 **10 Claims**



1. A millimeter wave imaging device comprising:

field emission means responsive to application of an external electric field thereto for emitting a carrier wave of electrons;

modulating means connected to the field emission means and responsive to absorption of power from an input radiation image for modulating the carrier wave of electrons to convert the input radiation image to an electron image;

storage means spaced from the field emission means for detecting and temporarily storing the electron image;

accelerating means for directing the emitted electron carrier wave onto the storage means;

amplifier means connected to the storage means for amplifying the stored electron image; and

display means disposed at the output of the amplifier means for displaying the amplified electron image.

4,086,512

CAMERA TUBE EMPLOYING SILICON-CHALCOGENIDE TARGET WITH HETEROJUNCTION

Jan Dieleman, and Arthur Marie Eugene Hoeberechts, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 515,454, Oct. 17, 1974, abandoned.

This application Mar. 17, 1976, Ser. No. 667,908

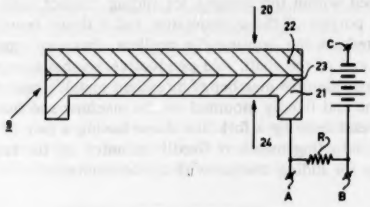
Claims priority, application Netherlands, Oct. 27, 1973, 7314803

Int. Cl.[2] H01J *29/45, 31/38*

U.S. Cl. 313—366 **4 Claims**

1. A camera tube comprising an electron beam source, a target to be scanned by an electron beam emerging from said source, said target comprising a radiation-receiving silicon layer and a chalcogen-containing layer having substantially instrinsic conductivity which forms a hetero junction with the

silicon layer on the side thereof scanned by the electron beam, said chalcogen-containing layer further comprises germanium



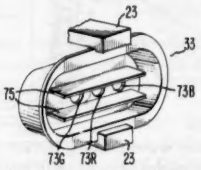
in an atomic ratio to the chalcogen component lying between 1:1 and 1:2.

4,086,513

PLURAL GUN CATHODE RAY TUBE HAVING PARALLEL PLATES ADJACENT GRID APERTURES

John Evans, Jr., deceased, late of Lancaster, Pa. (by Frances Mae Evans, executrix), assignor to RCA Corporation, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,610
Int. Cl.² H01J *29/50, 29/56*
U.S. Cl. 313—414 **6 Claims**



1. In a cathode-ray tube including an evacuated envelope comprising a faceplate and a neck connected by a funnel, a color phosphor screen on the inner surface of said faceplate, a multiapertured color selection electrode spaced from said screen, and electron gun means mounted in said neck for generating and directing a plurality of electron beams along paths through said electrode to said screen, said gun means including a plurality of cathodes and a plurality of grids spaced between said cathodes and said selection electrode, each of said grids having a plurality of apertures therein corresponding to the number of electron beams, and two of said grids forming a plurality of focusing fields corresponding to the number of electron beams, the improvement comprising,

at least one of said grids forming a plurality of focusing fields having attached parallel flat plates positioned on opposite sides of its apertures on its screen side, said plates being positioned to distort said plurality of focusing fields to form a noncircular electron beam.

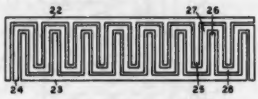
4,086,514

VARIABLE COLOR DISPLAY DEVICE

Karel Havel, P.O. Box 66, Station M, Toronto, Ontario, Canada (M6S 4T2)

Continuation-in-part of Ser. No. 613,265, Sep. 15, 1975, abandoned, which is a division of Ser. No. 424,069, Dec. 12, 1973, abandoned. This application Sep. 23, 1976, Ser. No. 725,789
Int. Cl.² G08B *5/36;* H01L *33/00*
U.S. Cl. 313—500 **3 Claims**

1. A variable color display device comprising a plurality of display areas, each said display area including three light emitting areas for emitting light signals of respectively different colors, each said light emitting area having a plurality of branches interleaved with like branches of the other light emitting areas to cause the light signals of different colors emitted therefrom to be substantially superimposed upon one



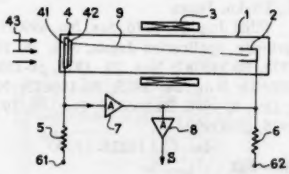
another to mix said colors without the need for an optical coupling element.

4,086,515

NON-DESTRUCTIVE READ-OUT DEVICE

Lucien Guyot, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jul. 22, 1975, Ser. No. 598,054
Claims priority, application France, Jul. 26, 1974, 74 26061
Int. Cl.² H01J *31/26*
U.S. Cl. 315—10 **12 Claims**



1. A non-destructive electrical read-out device for image read-out, comprising within an evacuated envelope:

means for emitting an electron beam located at a first end of said envelope;

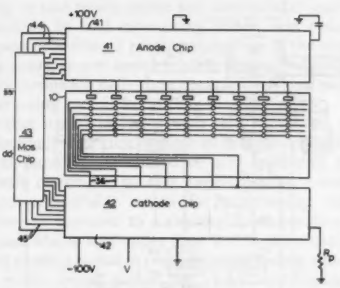
a target located at a second end of the envelope and placed at a bias voltage, on to which said image is projected, thus locally modifying the potential distribution;

means for deflecting the electron beam and producing scanning of said target by said beam, and for furnishing a read-out signal which is a function of said potential distribution; said device further comprising means for reducing the quantity of electrons deposited by said electron beam on said target, by an amount which is a function of said read-out signal, said function being proportional to approximately $1/n$ of the quantity of electrons needed to restore said potential distribution to its unmodified condition.

4,086,516
INTEGRATED CIRCUIT SYSTEM FOR OPERATING DISPLAY PANELS

James A. Ogle, Neshanic Station, and James Y. Lee, Kendall Park, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 22, 1976, Ser. No. 743,969
Int. Cl.[2] H05B *41/02*
U.S. Cl. 315—169 R 6 Claims



1. A system for operating a gas-filled multiple-position display panel, said panel having a plurality of groups of glow cathode elements and an anode associated with each group, corresponding cathodes of the different groups being interconnected by a single common conductor, there thus being a single common conductor for each cathode element in each of said groups, said system comprising

a plurality of cathode circuits, each cathode circuit including a connection to one of said common conductors, each circuit including a connection to a source of input cathode selecting signals and active circuit means responsive thereto,

an anode circuit bus,

a plurality of anode circuits, each anode circuit including (1) a first current flow path between said anode circuit bus and an anode in said display device, (2) a second current flow path between said anode circuit bus and a current source, and (3) means for receiving input anode energizing signals coupled to said second path, said first path including an active circuit element which couples the potential of said anode circuit bus to an anode, and

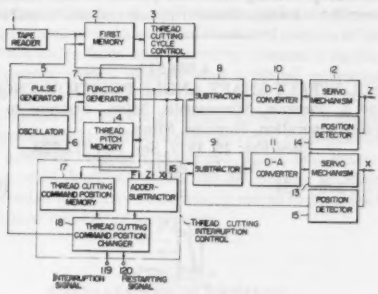
an auxiliary circuit coupled between said anode bus and all of said cathode circuits and providing an auxiliary current flow path for said cathode circuits during the re-ionization time for the cathode elements in said display panel, said auxiliary circuit including means for generating anode operating potential, as current flows therethrough, and for applying said anode operating potential to said anode circuit bus.

4,086,517
SYSTEM FOR CONTROLLING NUMERICALLY CONTROLLED MACHINE TOOL USED FOR CUTTING THREADS

Hiromi Yamaki, and Hiroaki Arai, both of Nagoya, Japan, assignors to Okuma Machinery Works Ltd., Nagoya, Japan

Filed Apr. 6, 1976, Ser. No. 674,097
Int. Cl.[2] G05B *19/24*
U.S. Cl. 318—39 14 Claims

1. A system for controlling the operation of a numerically controlled machine tool adapted for cutting a thread on a workpiece comprising means for reading various input information for instructing the cutting of the thread; first memory means for storing the input information; thread cutting cycle control means for controlling the thread cutting cycle according to the output of said first memory means; thread pitch memory means for storing the thread pitch information read by said reading means; pulse generating means for generating a pulse signal proportional to the rotation of the spindle of the tool; and function generating means for generating function outputs in response to the application of the outputs of said

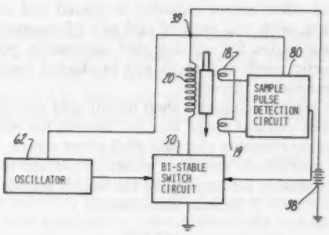


thread cutting cycle control means, said thread pitch memory means and said pulse generating means to thereby control a servo mechanism for feeding the tool in directions normal to each other, said control system comprising thread interruption control means for effecting a "pull-up motion of the tool".

4,086,518
ON DEMAND FLUID PUMP

John Robert Wilkinson, Dearborn, Mich., assignor to Facet Enterprises, Inc., Tulsa, Okla.

Filed Jul. 29, 1976, Ser. No. 709,636
Int. Cl.[2] H02K *33/00*
U.S. Cl. 318—127 3 Claims



1. An on-demand fluid pump comprising:

an electromechanical pump having a magnetically permeable piston reciprocally movable between a start position and an end position, relilient means for urging said piston to move from said start position to said end position in a variable period of time, said variable period being a function of pump load, a solenoid coil for retracting said piston from said end position to said start position in response to a current flow having a determinable duration, and sensing means generating an induced output signal in response to a current flow in said solenoid coil, said output signal having a value indicative of the position of said piston;

oscillator means for sequentially generating sample signals at predetermined intervals, said sample signals applied to said solenoid coil produce a current flow in said solenoid coil for a period of time substantially shorter than said minimum duration, and said predetermined intervals are longer than said minimum duration and substantially shorter than said variable period of time;

detection means for generating a retract signal in response to an induced output signal generated by said sensing means in response to the current flow in the solenoid coil produced by said sample signals and having a value indicative of the piston being at said end position;

bi-stable means in circuit relationship with said solenoid coil for initiating a current flow through said solenoid coil in response to a retract signal and for terminating the current flow through said solenoid coil in response to the next sequential sample signal; and

a source providing electrical power to said solenoid, said oscillator means, detector means and said bi-stable means.

4,086,519

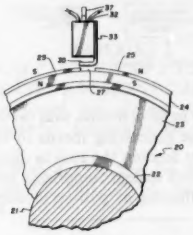
HALL EFFECT SHAFT ANGLE POSITION ENCODER

Erland K. Persson, Minneapolis, Minn., assignor to Electro-Craft Corporation, Hopkins, Minn.

Filed Feb. 25, 1977, Ser. No. 772,029

Int. Cl.[2] H02K *29/00*

U.S. Cl. 318—254 **19 Claims**



12. A Hall effect shaft angle commutating mechanism for use with a rotatable electrical device, comprising:

a. a pair of magnetic elements independent of any magnetic rotor of the electrical device, said magnetic elements having serially alternating polarities of magnetic north and south and being arranged in two consecutive circular strips;

b. a Hall effect sensor mounted in spaced and confronting relation, with one each of said pair of magnetic element circular strips for sensing said alternating polarities of magnetic north and south and producing output signals representative thereof;

c. rotor means including a shaft having said pair of magnetic element circular strips secured thereto for rotating said magnetic elements past said Hall effect sensor;

d. and operational amplifier means connected to said Hall effect sensors for amplifying the output signals thereof.

4,086,520

SPEED AND PHASE CONTROL SYSTEM

Kazuo Hashizaki, and Ryusuke Moriya, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

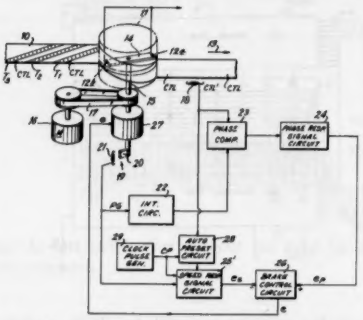
Continuation-in-part of Ser. No. 509,828, Sep. 27, 1974, abandoned. This application Feb. 19, 1976, Ser. No. 659,363

Claims priority, application Japan, Oct. 1, 1973, 48-110338

Int. Cl.[2] H02P *5/16*

U.S. Cl. 318—269 **6 Claims**

1. In an apparatus for reproducing information signals recorded in successive parallel tracks on a record medium along with respective control signals recorded on the record medium in predetermined positional relationship to said tracks, and in which the apparatus includes rotary transducer means for scanning said tracks in succession so as to reproduce the information signals recorded therein as the record medium is advanced, and fixed transducer means for reproducing said control signals with a repetition rate that is dependent on the speed of advancement of the record medium: a speed and phase control system for said rotary transducer means comprising rotational speed detector means for producing pulse signals representative of the rotational position of said rotary transducer means and having a repetition rate that is a function of the rotational speed of said rotary transducer means; phase comparison means for producing a phase responsive signal having a voltage level that is varied in response to changes in the relative timing of said reproduced control signals and said pulse signals; means for producing a speed responsive signal including a source of clock pulses, counting means for counting said clock pulses for time intervals determined by said repetition rate of said pulse signals from the rotational speed detector means, means for converting the count of said counting means, at the end of each of said time intervals, to a corresponding voltage level of said speed responsive signal, and means for establishing the initial count of said counting means



at the commencement of each of said time intervals in dependence on said repetition rate of said reproduced control signals so that the voltage level of said speed responsive signal is varied in response to changes in said repetition rate of the pulse signals only when said changes occur without corresponding changes in said repetition rate of the reproduced control signals; and means for controlling the rotation of said rotary transducer means in response to the voltage levels of said phase responsive signal and said speed responsive signal.

4,086,521

DIGITAL SYSTEM FOR STABILIZING THE SPEED OF A CLOCKWORK MOTOR

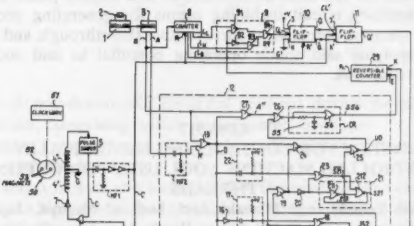
Roger Bühler, Le Locle, Switzerland, and Christian Faivre, Morteau, France, assignors to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

Filed May 14, 1976, Ser. No. 686,524

Claims priority, application Switzerland, May 16, 1975, 6376/75

Int. Cl.[2] G05B *5/00*; H02P *5/00*

U.S. Cl. 318—307 **10 Claims**



1. A speed-stabilizing system for a motor driving a load, comprising:

an energizing circuit for said motor;

a source of monitoring pulses coupled with said motor, said monitoring pulses having a cadence proportional to the actual motor speed;

a generator of reference pulses of fixed frequency corresponding to a preselected motor speed in a range between

a predetermined lower speed limit and a predetermined higher speed limit, said generator further producing a series of timing pulses at a cadence equaling a predetermined multiple of said fixed frequency;

phase-comparison means connected to said source and to said generator for emitting a first phasing signal upon said monitoring pulses recurring at a rate higher than that of said reference pulses and emitting a second phasing signal upon said monitoring pulses recurring at a rate lower than that of said reference pulses;

pulse-counting means connected to said generator for stepping by said timing pulses and connected to said source for resetting by said monitoring pulses, said pulse-counting means producing a reading indicative of the magnitude of the actual motor speed relative to said range;

supply means for delivering recurrent driving pulses to said energizing circuit for accelerating the motor;

inhibiting means in series with said energizing circuit for selectively blocking passage of said driving pulses; and

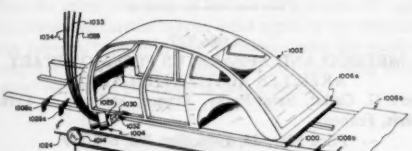
logical circuitry connected to said inhibiting means and jointly controlled by said pulse-counting means and said phase-comparison means for suppressing said driving pulses in response to a reading corresponding to motor speeds above said upper limit and in the presence of said first phasing signal in response to a reading corresponding to motor speeds within said range, said logical circuitry allowing delivery of said driving pulses in response to a reading corresponding to motor speeds below said lower limit and in the presence of said second phasing signal in response to a reading corresponding to motor speeds within said range.

4,086,522

COMPUTER ASSISTED TEACHING ARRANGEMENT FOR CONVEYOR LINE OPERATION

Joseph F. Engelberger; Maurice J. Dunne, both of Newtown, and William Perzley, Weston, all of Conn., assignors to Unimation, Inc., Danbury, Conn.

Filed Sep. 8, 1976, Ser. No. 721,805
Int. Cl.[2] B25J *9/00*
U.S. Cl. 318—568 **92 Claims**



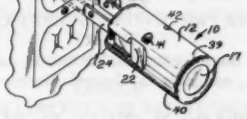
1. In a programmable manipulator, the combination of, a manipulator arm movable in a plurality of axes, a continuously moving conveyor positioned adjacent said programmed manipulator, memory storage means having stored therein a plurality of digital command signals at least some of which correspond to the program step position to which said arm is to be moved, one of said plurality of digital command signals including a digital representation of said conveyor position, one of said command signals for at least one program step including a continuous path mode signal, encoder means for each of said axes and said moving conveyor operative to develop position signals corresponding to the actual position of said arm in said plurality of axes and the actual position of said moving conveyor, address means for causing said stored command signals to appear at the output of said memory means in a predetermined sequence, means operative in the absence of said continuous path mode signal for moving said arm to the position represented by said stored command signals, means responsive to said continuous path mode signal for developing a digital signal equal to the difference between a command signal for a program step which includes said continuous path mode signal and the preceding command signal, means for dividing said difference signal into a predetermined number of increments according to said stored digital command signals at a program step which includes said continuous path mode signal, means for producing a series of artificial interpolation command signals equal in number to said predetermined number of increments which differ from said preceding command signals by said increments, means utilizing said artificial interpolation command signals to move said arm in a substantially continuous path, means for detecting the occurrence of a predetermined state of equality between said conveyor positional signal and said artificial conveyor command signal, and means responsive to said detecting means for developing an advance signal operative to control said dividing means to generate said predetermined number of increments.

4,086,523

RECHARGEABLE BATTERY

Koji Izumi, Nagano, Japan, assignor to Izumi Products Company, Elk Grove Village, Ill.

Filed Jan. 17, 1977, Ser. No. 760,117
Int. Cl.[2] H01M *10/46*
U.S. Cl. 320—2 **12 Claims**



1. In a rechargeable battery having cell means for storage of electrical energy, housing means enclosing said cell means, rectifier means within said housing means, and a pair of output terminals exposed to outwardly of said housing for delivering electrical energy from said cell means, the improvement comprising:

a pair of prongs arranged for electrical connection to a female power supply receptacle;

means for movably mounting said prongs at opposite sides of one of said terminals to extend selectively in a first disposition straddling one end of said housing and a second disposition projecting from said one end in parallel spaced relationship to be received in said female power receptacle with said one terminal effectively shielded from inadvertent contact by said housing and projecting prongs; and

circuit means selectively interconnecting said cell means, rectifier means, terminals, and prongs including switch means for electrically connecting said prongs to said rectifier means and cell means to permit recharging of said cell means from the female power supply receptacle only when said prongs are disposed in said second disposition.

4,086,524

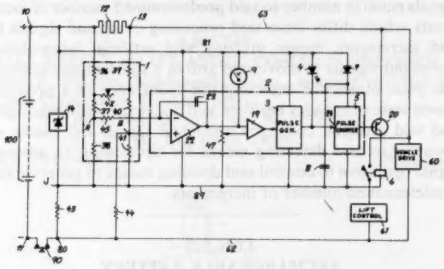
CHARGE MONITOR FOR ELECTRIC BATTERY

Manfred Kremer, Hamburg, Germany, assignor to Still GmbH (vormals SE-Fahrzeugwerke GmbH), Hamburg, Germany

Division of Ser. No. 618,922, Oct. 2, 1975, Pat. No. 3,997,888.
This application Sep. 9, 1976, Ser. No. 722,064
Claims priority, application Germany, Oct. 2, 1974, 2446958
Int. Cl.[2] H02J *7/00*
U.S. Cl. 320—33 **4 Claims**

1. A method of monitoring the state of charge of an electric battery supplying current to a load connected across its termi-

nals, comprising the steps of simultaneously measuring the terminal voltage and the load current of the battery, deriving from the values so measured a resultant test parameter, comparing said test parameter with a predetermined threshold designating the transition from a normal range indicative of a state of effective charge to an off-normal range indicative of a

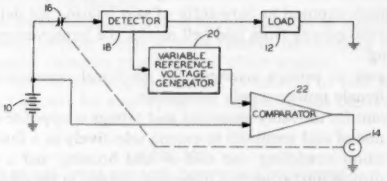


state of approaching depletion, generating counting pulses during periods in which said test parameter falls into said off-normal range, storing the resulting pulse counts during intervals of return to said normal range, and switching off at least a significant part of said load upon the cumulative pulse count reaching a predetermined magnitude.

4,086,525
CIRCUIT FOR PREVENTING OVERDISCHARGE OF A BATTERY

Ole N. Ibsen, Bloomington, and Thomas E. Anderson, Normal, both of Ill., assignors to General Electric Company, New York, N.Y.

Filed Dec. 28, 1976, Ser. No. 755,103
Int. Cl.[2] H02J 7/00
U.S. Cl. 320—33 **5 Claims**



1. A circuit for preventing overdischarge of a rechargeable lead acid storage battery comprising:

(a) a direct current sensor for sensing the rate of discharge of said battery;

(b) means responsive to said direct current sensor for generating a reference voltage which varies inversely with the sensed rate of discharge of said battery, said reference voltage generating means further comprising:

(i) an analog inverting amplifier having an input terminal and an output terminal, said input terminal being electrically coupled to said direct current sensor; and

(ii) first and second resistors each having one end electrically connected together to form an output of said reference voltage generating means, another end of said first resistor being electrically connected to the output terminal of said analog inverting amplifier, and another end of said second resistor being electrically connected to a fixed reference voltage source;

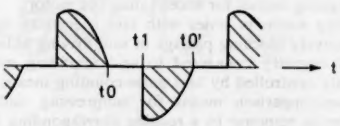
(c) means for comparing the actual voltage of said battery with the generated reference voltage for producing a triggering signal when the generated reference voltage is at least equal to the actual voltage of said battery; and

(d) means responsive to the triggering signal for disconnecting said battery from a load.

4,086,526
METHOD OF AND A POWER SWITCHING DEVICE FOR REGULATING THE ELECTRICAL POWER DELIVERED TO A CONSUMER IN AN A.C. NETWORK

Hans-Dieter Grüdelbach, Plon, Germany, assignor to Poul Hahn Evers, Pura, Switzerland

Filed Mar. 1, 1977, Ser. No. 773,279
Claims priority, application Switzerland, Sep. 9, 1976, 11447/76
Int. Cl.[2] G05F 1/44
U.S. Cl. 323—34 **9 Claims**

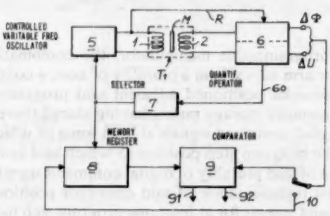


1. In a method of regulating electrical power supplied via a current path to at least one consumer in an A.C. network which involves setting desired current flow angle using a power switching device connected in the current path to the consumer, the improvement comprising providing as the switching device at least two transistors, connected in parallel and mutually decoupled, connecting collector-emitter leads of said transistors in the current path to the consumer, switching the transistors alternately at a switching frequency higher than the line frequency in such manner that the time intervals of their ON states overlap cutting the switching device ON at the beginning of each half wave of A.C. line voltage, at least approximately at a phase angle of 0°, and cutting the power switching device OFF at a phase angle corresponding to the desired current flow angle; whereby the alternate connection of the transistors takes place in each half period of the A.C. line voltage beginning at its start and lasting until the desired current flow angle is reached.

4,086,527
METHOD AND APPARATUS FOR MONETARY ARTICLES AUTHENTIFICATION

Robert G. Cadot, Saint-Peray, France, assignor to Crouzet, Paris, France

Filed Mar. 24, 1976, Ser. No. 669,759
Claims priority, application France, Mar. 25, 1975, 75 09572
Int. Cl.[2] G01R 33/00
U.S. Cl. 324—233 **5 Claims**



1. An authentication method for standardized objects, such as in particular monetary articles, in which an object to be authenticated is introduced into the field located between an emitter and a receiver delivering at least an alternative physical quantity, whose quantitative alteration produced by the presence of said object in said field is measured, the result being compared with a reference value pre-stored in a memory and distinctive of the object to authenticate, whereby, within a tolerance approximation, an authentication criterion is de-

ducted, method characterised by the fact that said alteration is measured at different frequencies, that corresponding alterations are successively measured and then simultaneously compared with said respective reference quantities.

4,086,528

CAPACITIVE TRANSDUCERS

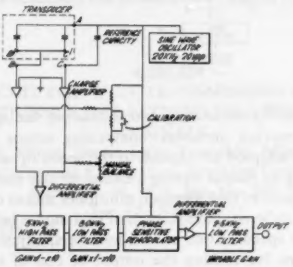
Hyman Walton, Beckermet, England, assignor to United Kingdom Atomic Energy Authority, England

Filed Sep. 7, 1976, Ser. No. 720,822

Claims priority, application United Kingdom, Sep. 17, 1975, 38191/75; Oct. 16, 1975, 42546/75

Int. Cl.[2] G01R *27/26*

U.S. Cl. 324—61 R **11 Claims**



1. Apparatus for determining a linear quantity, which apparatus comprises a capacitative transducer having members adapted to form at least one capacitance variable in accordance with changes in said quantity; a capacitor of substantially constant capacitance with respect to said changes; two charge amplifiers; means connecting the capacitative transducer to one of the charge amplifiers and the constant capacitor to the other charge amplifier in two separate arms of a four terminal network having four arms, the charge amplifiers having connections such that the input impedances of the charge amplifiers form the other two arms of the network; means for applying an alternating current carrier input signal to the transducer and the constant capacitor, and receiving means for receiving the output from both charge amplifiers and providing an output signal related to the value of said quantity.

4,086,529

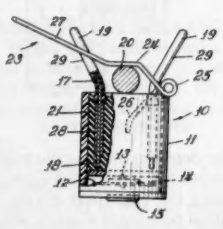
FAULT INDICATOR AND MEANS FOR RESETTING THE SAME

Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60062

Filed Jul. 26, 1976, Ser. No. 708,549

Int. Cl.[2] G01R *19/16, 1/20*

U.S. Cl. 324—127 **17 Claims**



1. A fault indicator responsive to the occurrence of an alternating fault current of predetermined minimum amplitude in a conductor and means for resetting the same, comprising in combination:

a generally cylindrical housing;

a target mounted at one end of said housing for rotation in a plane generally perpendicular to the axis of said housing between a fault indicating position and a reset position, at least a portion of said target being visible from the exterior of said housing to indicate the position of said target;

a target permanent magnet having diametrically opposed magnetic poles of like gender mounted for rotation with said target;

a stationary permanent magnet of high coercive force disposed in magnetic communication with said target magnet, and having magnetic poles arranged for biasing said target magnet to position said target in said fault indicating position;

a pair of pole pieces extending longitudinally in generally parallel-spaced relationship within said housing from said one end of said housing to the other end thereof, each of said pole pieces being formed of a magnetizable material of low coercive force subject to being demagnetized upon occurrence of a current in the conductor in excess of said predetermined minimum level, said pole piece each including an end portion projecting from said other end of said housing and defining therewith means for receiving the conductor, the other ends of said pole pieces being disposed in magnetic communication with opposing poles of said target magnet;

and reset means comprising a receptacle dimensioned for telescopic engagement with said housing and including winding coaxially disposed therein for magnetic communication with said pole pieces when said housing is seated in said receptacle for magnetizing said pole pieces whereby said other ends thereof bias said target magnet to position said target in said reset position.

4,086,530

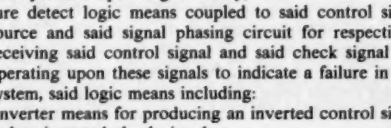
DETECTION CIRCUIT FOR MONITORING THE FAILURE OF A SYSTEM TO RESPOND IN A PLANNED MANNER TO AN INPUTTED CONTROL SIGNAL

Vincent G. Coppola, North Branford; Flavio M. Manduley, Seymour, and Daniel F. Diugos, Huntington, all of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Nov. 11, 1975, Ser. No. 631,167

Int. Cl.[2] G01R *31/02, 31/28*

U.S. Cl. 324—133 **5 Claims**



1. A detection circuit for monitoring the failure of a system to respond in a planned manner to an inputted control signal, comprising:

a control signal source for providing a control signal to the system being monitored;

a signal phasing circuit connected to the output of said system being monitored for producing a check signal which changes in phase with said control signal, when said system is operating normally, and

failure detect logic means coupled to said control signal source and said signal phasing circuit for respectively receiving said control signal and said check signal and operating upon these signals to indicate a failure in said system, said logic means including:

A. inverter means for producing an inverted control signal and an inverted check signal;

B. comparing means for receiving the control signal, the check signal, and the inverted signals for comparing: first, the check signal with the inverted control signal; and second, the control signal with the inverted check signal; and

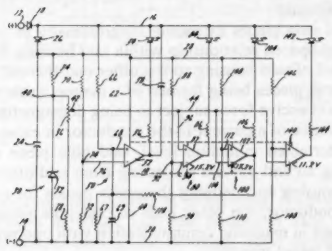
C. indicating means connected to said comparing means for generating a failure-indicating signal when both of the first and second comparisons are equal.

4,086,531

ELECTRICAL SYSTEM TEST APPARATUS

Donald R. Bernier, Lake Orion, Mich., assignor to Compunetics, Incorporated, Troy, Mich.

Filed Apr. 26, 1976, Ser. No. 680,484
Int. Cl.[2] G01R *31/02, 19/16*
U.S. Cl. 324—158 MG **29 Claims**



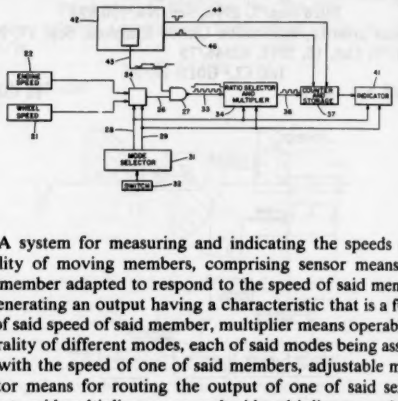
1. In a test system for testing and analyzing an electrical system including an alternator assembly, a battery charged by the alternator assembly and connected thereto, and a regulator connected to the alternator assembly for controlling the charging of the battery, the alternator assembly including an alternator and a rectifier circuit whereby an output voltage is provided having a d-c voltage with a superimposed a-c ripple, the output voltage being provided at an output terminal on the alternator and an electrical ground, said system comprising a plurality of indicator circuits for indicating the condition of at least two of the alternator, rectifier circuit, regulator and/or battery, an input circuit means connected between the alternator assembly and the plurality of indicator circuits for providing an unfiltered voltage having an magnitude varying in accordance with the variations in magnitude of the d-c voltage and the a-c ripple, said input circuit means comprising only a single pair of lead conductors with one of said conductors adapted to be connected to the output terminal of the alternator and the other adapted to be connected to the electrical ground whereby said unfiltered voltage is provided by said pair of conductors without altering the alternator assembly, said input circuit means also providing a filtered voltage derived from said unfiltered voltage from said single pair of conductors and having a generally uniform magnitude varying in accordance with the magnitude of the output voltage, said input circuit means also providing a source of a reference voltage derived from said unfiltered voltage from said single pair of conductors and having a preselected magnitude less than and independent of the magnitude of the output voltage, said reference voltage being interconnected with at least some of said indicator circuits, one of said indicator circuits being connected to receive said unfiltered voltage and said filtered voltage for comparing said filtered voltage and said unfiltered voltage and providing an output indication when the magnitude of said filtered voltage and the magnitude of said unfiltered voltage including its a-c ripple bear a preselected relationship, one to the other, the remainder of said plurality of indicator circuits being connected as comparator circuits, one input to said remainder of said indicator circuits being connected to sense a preselected percentage of said filtered voltage and comparing that preselected percentage to said reference voltage, each of said remaining indicator circuits providing an output indication when said percentage bears a preselected relationship to said reference voltage to indicate selected faults in the alternator, regulator and/or the battery.

4,086,532

SPEED RESPONSIVE AND INDICATING SYSTEM

Howard A. Aronson, Lincolnwood, and San Chi Chung, Lombard, both of Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed Feb. 11, 1976, Ser. No. 657,040
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—166 **21 Claims**



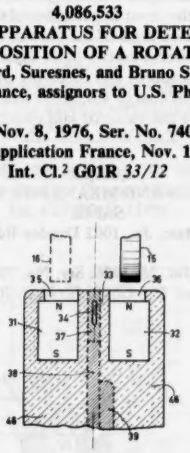
1. A system for measuring and indicating the speeds of a plurality of moving members, comprising sensor means for each member adapted to respond to the speed of said member for generating an output having a characteristic that is a function of said speed of said member, multiplier means operable in a plurality of different modes, each of said modes being associated with the speed of one of said members, adjustable mode selector means for routing the output of one of said sensor means to said multiplier means, and said multiplier means being operable to multiply said characteristic by a different preselected ratio in each of said modes, indicator means connected to said multiplier and indicating said multiplied characteristic, said adjustable mode selector means being further connected to set said multiplier for operation in one of said modes, and said multiplier means including manually adjustable ratio selector means for coding said multiplier means to multiply said characteristic by a preselected ratio.

4,086,533

HALL EFFECT APPARATUS FOR DETERMINING THE ANGULAR POSITION OF A ROTATING PART

Jean-Pierre Ricouard, Suresnes, and Bruno Schorter, Morsang, Orge, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 8, 1976, Ser. No. 740,004
Claims priority, application France, Nov. 12, 1975, 75 34439
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—208 **7 Claims**



1. A device for detecting the specific angular positions of a rotating part comprising, a Hall-effect crystal, a fixed magnetic circuit for exciting the Hall-effect crystal which circuit includes two identical permanent magnets which are disposed at a small distance from and substantially parallel to each other and having adjacent poles of like magnetic polarity situated in proximity to the Hall-effect crystal to apply a magnetic excitation field thereto, said fixed magnetic circuit having an axis of symmetry along which the crystal is disposed, said rotating

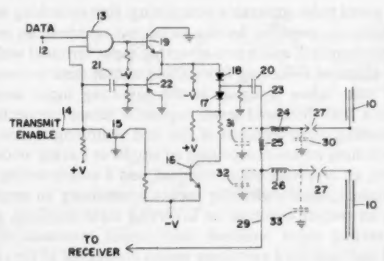
part including first and second soft-magnetic elements respectively located on opposite sides of said axis of symmetry and each having a leading end and a trailing end defined by the direction of travel of the rotating part, said first and second soft magnetic elements being relatively displaced so that the trailing end of one soft magnetic element coincides with the leading end of the other soft magnetic element and movement of the rotating part causes said first and second soft magnetic elements to successively and alternately pass in the proximity of said adjacent poles, a first soft-magnetic element which passes one of the magnets near its said adjacent pole being immediately followed by a second soft-magnetic element which passes the other magnet near its said adjacent pole to cause a reversal in the direction of the active component of the magnetic excitation field whereby the Hall-effect cyrstal responds by reversing the polarity of an output signal generated therein.

4,086,534

CIRCUIT FOR WIRE TRANSMISSION OF HIGH FREQUENCY DATA COMMUNICATION PULSE SIGNALS

Gerald R. Olson, Forest Lake Township, Minn., assignor to Network Systems Corporation, Brooklyn Center, Minn.

Filed Feb. 14, 1977, Ser. No. 768,226
Int. Cl.[2] H04B *1/38*
U.S. Cl. 325—15 **8 Claims**



1. Circuitry for use in wire transmission of high frequency data communication pulse signals comprising: first and second lengths of identical coaxial cable; a delay line network connecting adjacent ends of said first and second coaxial cable lengths, said delay line network comprising inductance having a value which combines with distributed capacitance to substantially equal the characteristic impedance of the coaxial cable at the frequency of the data signal; conducting means connected to said delay line network for carrying data signals on the coaxial cable to a receiver; and electrical circuit means connected to said delay line network for selectively feeding transmitted data pulse signals to the coaxial cable.

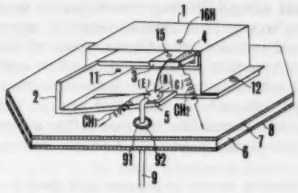
4,086,535

MICROWAVE OSCILLATOR

Toshiji Shibata, Toride, and Shinji Fujiwara, Moriya, both of Japan, assignors to Meisei Electric Co. Ltd., Tokyo, Japan

Filed Jun. 2, 1976, Ser. No. 692,045
Claims priority, application Japan, Jun. 6, 1975, 50-68312
Int. Cl.[2] H04B *1/04*
U.S. Cl. 325—128 **18 Claims**

9. A microwave oscillator, comprising a resonance circuit, an active element, other circuit member and a base plate having two sides characterized in that the resonance circuit is a three dimensional body, that an active element is mounted outside of the resonance circuit on a prolonged part integrally connected with the resonance circuit, that said element includes a signal output electrode, that an antenna element is connected to the electrode and projects from one side of the base plate in such a manner that the antenna element stands up on the other side of the base plate, and that a conductor for forming a part of the antenna effectively extends over the other



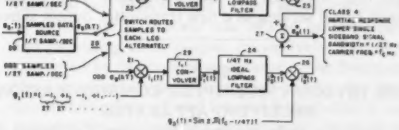
surface of the base plate, on which other surface the antenna element is projecting.

4,086,536

SINGLE SIDEBAND TRANSMITTER APPARATUS

William F. Acker, Seminole, Fla., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Jun. 24, 1975, Ser. No. 589,953
Int. Cl.[2] H04B *1/68;* H03C *1/52*
U.S. Cl. 325—137 **34 Claims**



1. A single sideband transmitter for frequency translating an input signal, providing by an input signal source, having a frequency content, in a frequency domain representation thereof, occurring between second and third reference frequencies each of which occurs on a side of a first reference frequency where said third reference frequency exceeds said second reference frequency, a first bandwidth comprising those frequencies which occur between said second reference frequency and said third reference frequency, said transmitter comprising:

a first translating means to receive said input signal from said input signal source, said first translating means being capable of translating said input signal in frequency, in an amount equal to a first frequency shift, by effective multiplication of said input signal with a periodic first translating signal from a first translating signal source to thereby provide a first intermediate signal, said first frequency shift being sufficient to provide a replica of said frequency content between a first selected frequency and a second selected frequency where said second selected frequency is less than said third reference frequency but exceeds said first selected frequency;

a second translating means to also receive said input signal from said input signal source, said second translating means being capable of translating said input signal in frequency, in an amount equal to a second frequency shift, by effective multiplication of said input signal with a periodic second translating signal from a second translating signal source to thereby provide a second intermediate signal;

a first filtering means to receive said first intermediate signal, said first filtering means having as its impulse response a first filter impulse response, repeated twice in time and summed, of a filter capable of filtering said first intermediate signal about said first reference frequency to substantially remove frequencies therein which occur approxi-

mately beyond said second selected frequency , said first filtering means filtering said first intermediate signal to provide a third intermediate signal;

a second filtering means to receive said second intermediate signal, said second filtering means having as its impulse response a second filter impulse response, repeated twice in time and summed, of a filter capable of filtering said second intermediate signal about said first reference frequency to substantially remove frequencies therein which occur approximately beyond said second selected frequency , said second filtering means filtering said second intermediate signal to provide a fourth intermediate signal;

a third translating means to receive said third intermediate signal, said third translating means for translating said third intermediate signal in frequency, in an amount equal to a third frequency shift, by effective multiplication of said third intermediate signal with a periodic third translating signal from a third translating signal source to thereby provide a fifth intermediate signal, said third frequency shift differing from said first frequency shift;

a fourth translating means to receive said fourth intermediate signal, said fourth translating means for translating said fourth intermediate signal in frequency, in an amount equal to a fourth frequency shift, by effective multiplication of said fourth intermediate signal with a periodic fourth translating signal from a fourth translating signal source to thereby provide a sixth intermediate signal; and

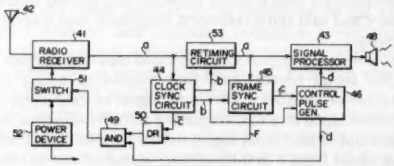
a summing means to receive said fifth and sixth intermediate signals, said summing means being capable of combining said fifth and sixth intermediate signals to form a combined signal serving as a first transmitter output signal.

4,086,537

TIME DIVISION MULTIPLEX COMMUNICATION RECEIVING APPARATUS

Shigeru Asakawa, Fujisawa; Fumio Sugiyama, Yokohama; Akio Gotoh, and Shigenori Okamoto, both of Tokyo, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo and Tokyo Shibaura Electric Co., Ltd., Kawasaki, both of, Japan

Filed Jan. 26, 1976, Ser. No. 652,237
Claims priority, application Japan, Jan. 24, 1975, 50-10342
Int. Cl.[2] H04J *3/08*
U.S. Cl. 325—478 **15 Claims**



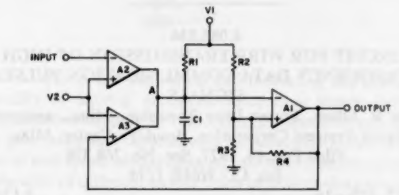
1. A time-division multiplex communication receiving apparatus for identifying the subscriber's individual code among a plurality of subscriber's individual codes which are arranged sequentially in time series fashion in a time-division multiplex signal from a key station, said apparatus comprising a receiving section for receiving a time-divisional multiplex signal having clock signal components and frame signal components; a signal processing means for extracting, in synchronization with the clock signal components of said multiplex signal, the subscriber's individual code from a predetermined time zone of said multiplex signal; a first synchronization means to be synchronized with the clock signal components of said multiplex signal; a second synchronization means to be synchronized with the frame signal components of said multiplex signal; a classifying means for classifying the receiving condition of said receiving section in accordance with the combination of the synchronization states of said first and second synchronization means; a control pulse generating means which connected to said processing means for generating, when driven by an output signal from said first and second synchronization means, a control pulse which designates a predetermined period corresponding to the output signals of said synchronization means; and a switching means for controlling, in response to an output signal from said classifying means, a power supply to said receiving section during the period designated by the control signal.

4,086,538

GATED PULSE GENERATOR

Donald S. Foreman, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 29, 1975, Ser. No. 644,670
Int. Cl.[2] H03K *5/20*
U.S. Cl. 328—112 **3 Claims**



1. A gated pulse generator comprising: first switching means comprising an amplifier having an output terminal, an inverting input terminal, and a non-inverting input terminal with the output terminal switching from a first output state to a second output state when a signal at the inverting input terminal reaches a first threshold level; capacitor means connected to the inverting input terminal of the first switching means; second switching means comprising an amplifier having an output terminal, an inverting input terminal, and a non-inverting output terminal; third switching means comprising an amplifier having an output terminal, an inverting input terminal, and a non-inverting input terminal; said output terminals of said second and said third switching means connected to the capacitor means for controlling the charging of the capacitor means as a function of an input signal; a reference potential applied to the non-inverting input terminal of the second switching means and the inverting input terminal of the third switching means; said input signal being applied to the inverting input terminal of the second switching means; and the output terminal of the first switching means being connected to the non-inverting input terminal of the third switching means for causing the first switching means to switch between said output states, whereby an output pulse is provided.

4,086,539

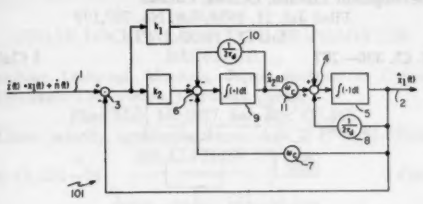
FIRST-ORDER PHASE-LOCK LOOP

Donald E. Gustafson, Lexington, and Jason L. Speyer, Winchester, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 11, 1972, Ser. No. 280,026
Int. Cl.[2] H03B *3/06*
U.S. Cl. 328—155 **5 Claims**

1. A first-order phase-lock loop that comprises, in combination: a first summer to receive an input which contains a signal corrupted by noise; a first gain element connected to receive as input thereto the output of the first summer; a second summer connected to receive as an input thereto the output of said first gain element; a first integrator connected to receive as input thereto the output of the second summer and to provide an output which is the estimate of the signal, the output of the first integrator being fed back negatively as one input to each of the first and second summers and as one negative input to a third summer, a first system parameter means connected in the feedback loop between the first integrator and the third sum-

mer; a second system parameter means connected in the feedback loop between the first integrator and the second summer; and a second integrator connected to receive as input thereto



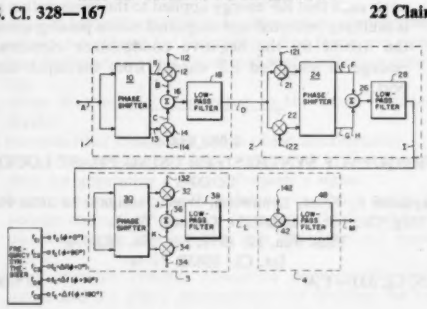
the output of the third summer and to provide an output which is fed back to the third summer through a third system parameter means and as an input to the second summer through a fourth system parameter means.

4,086,540

TRANSLATING FILTER

Arthur D. Delagrange, Sykesville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1977, Ser. No. 767,020
Int. Cl.[2] H03B *1/04*; H04B *15/00*
U.S. Cl. 328—167 **22 Claims**



1. An electronic filter network of the type having a single cutoff frequency, Δf, comprising:

in a first stage adapted for receiving a noisey incurrent signal having a spectrum of interest with a greatest frequency component, f_{MAX}, a circuit, comprising:

phase differencing means for providing at a pair of parallel channels quadrature phases of the components of said incurrent signal spectrum;

a pair of modulators each driven by a different quadrature phase of a carrier signal of frequency f_c, each coupled in series with a different one of said parallel channels and providing as an output, respectively the spectrum conveyed by its channel modulated at the frequency of the carrier signal, whereby the leading quadrature phase of said incurrent signal is modulated by the lagging quadrature phase of said carrier signal;

a summing amplifier coupled to receive the output of each of said pair of modulators; and,

a low-pass filter having a low-pass cutoff frequency greater than $f_c + f_{MAX}$ and less than the first harmonic of f_c for delivering as the product of the first stage a spectrum formed of the components of the response of said summing amplifier having frequencies less than the low-pass cutoff frequency;

in a second stage receiving quadrature phases of an incremented carrier signal of frequency $f_c + \Delta f$, a circuit, comprising:

a pair of modulators adapted to receive the product of said first stage, each driven by a different quadrature phase of said incremented carrier signal, and each delivering as an intermediate output the spectrum of the product of the first stage modulated at the frequency of said incremented carrier signal;

phase differencing means for providing through different channels of a pair of parallel channels, in response to reception of the intermediate output of each of said modulators quadrature phases of the component frequencies of the intermediate output,

whereby the component frequencies of that intermediate output modulated by the incremented carrier signal having a quadrature phase closest to an integer multiple of one-half π are advanced in phase by ninety degrees with respect to the same frequency components of the other intermediate output;

a summing amplifier coupled as a junction between said pair of parallel channels, for providing a single output spectrum; and,

a low-pass filter having a low-pass cutoff frequency less than f_c but greater than Δf, for delivering as the product of the second stage a spectrum formed of the components of the response of said summing amplifier having frequencies less than the low-pass cutoff frequency;

in a third stage receiving the same quadrature phases of said incremented carrier signal of frequency $f_c + \Delta f$, as those quadrature phases received by said second stage, a circuit, comprising:

phase differencing means for providing at a pair of parallel channels quadrature phases of the components of the product of said second stage;

a pair of modulators each driven by a different quadrature phase of said incremented carrier signal, each coupled in series with a different one of said parallel channels and providing as an output, respectively the spectrum conveyed by its channel modulated at the frequency of the incremented carrier signal whereby the leading quadrature phase of said intermediate output is modulated by that incremented carrier signal having a quadrature phase closest to an integer multiple of one-half π with respect to the quadrature phase of the other carrier signal;

a summing amplifier coupled to receive the output of each of said pair of modulators; and,

a low-pass filter having a low-pass cutoff frequency greater than $f_c + f_{MAX}$ and less than the first harmonic of $f_c + \Delta f$, for delivering as the product of the third stage a spectrum formed of the components of the response of said summing amplifier having frequencies less than the low-pass cutoff frequency;

in a fourth stage receiving a carrier signal of frequency f_c, a circuit, comprising:

a modulator adapted to receive the product of said third stage and driven by said carrier signal to deliver as an intermediate output the spectrum of the product of said third stage modulated at the frequency of said carrier signal; and,

a low-pass filter having a low-pass cutoff frequency less than f_c but greater than Δf, coupled to recieve the response of said modulator.

4,086,541

TIME DIVISION MULTIPLEXING AMPLIFIER

Kazuo Katou, Ibaraki; Takashi Sase, and Ikuho Horinaka, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 13, 1976, Ser. No. 749,805
Int. Cl.[2] H03F *1/14*
U.S. Cl. 330—51 **9 Claims**

1. A time division multiplexing amplifier for receiving a differential-mode signal involving a common-mode voltage and producing an amplified differential-mode signal, comprising:

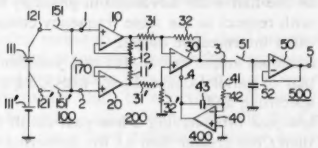
a first terminal and a second input terminal to which said differential-mode signal from an external differential-mode signal source is applied;

an output terminal;

differential amplifier means including at least one differential amplifier and having a first input and a second input, an output connected to said output terminal, and an offset signal control terminal;

a pair of first switching means, said first and second inputs being connected to said first and second terminals through one of said first switching means, respectively;

second switching means, connected between said first and second inputs of the differential amplifier means, for short-



circuiting said first and second inputs and applying said common-mode voltage to said first and second inputs during a predetermined period of time when one of said first switching means is closed prior to amplification of said differential signal; and

first sample holding means, connected between said output and offset signal control terminal of said differential amplifier means, for adjusting to zero an offset voltage produced by said differential amplifier means when said common-mode voltage is applied to said first and second inputs.

4,086,542

COMPLEMENTARY PUSH-PULL AMPLIFIER

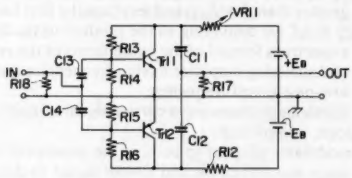
Shingo Kamiya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 10, 1977, Ser. No. 767,484

Claims priority, application Japan, Feb. 12, 1976, 51-14087[U]

Int. Cl.² H03F *3/183*

U.S. Cl. 330—268 **11 Claims**



1. A complementary push-pull amplifier circuit comprising:

a pair of complementary transistors each including base, collector and emitter and connected in push-pull relation;

an input circuit connected to the base of each of said pair of transistors;

an output circuit connected to the collector of each of said pair of transistors;

means for supplying a voltage to said pair of transistors;

a resistance connected in series with the collector circuit of said transistors for dropping down a large part of the supply voltage and applying a small part of said supply voltage across said transistors; and

bias voltage circuit means connected to the electrodes of each transistor for dividing the voltage between the collector and the emitter of the transistor and establishing the base bias voltage between the base and the emitter of the transistor by said divided voltage, whereby the idling current through said transistors is substantially stabilized against changes in external conditions.

4,086,543

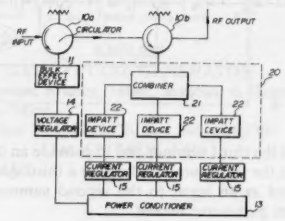
TRAVELLING WAVE HYBRID JUNCTION AMPLIFIER

Jan Nigrin, Edmonton, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jul. 21, 1976, Ser. No. 707,199

Int. Cl.² H03F *3/60*

U.S. Cl. 330—287 **5 Claims**



1. A microwave travelling wave hybrid junction amplifier comprising:

(a) a microwave hybrid junction having four ports one of which acts as an input-output port for the amplifier,

(b) negative conductance elements acting as reflection type amplifiers connected to and terminating the other three ports such that RF energy applied to the input-output port is multiply reflected and amplified while passing through the hybrid by the negative conductance elements to emerge as amplified RF energy from the input output port.

4,086,544

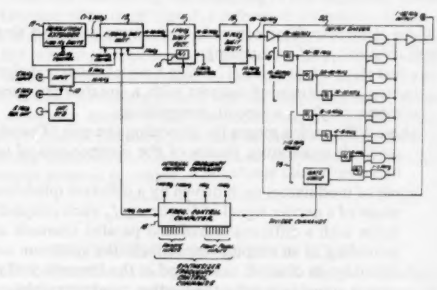
FREQUENCY SYNTHESIZER USING PHASE LOCKED LOOPS

Raymond L. Fried, Lynnwood, Wash., assignor to John Fluke Mfg. Co., Inc., Mountlake Terrace, Wash.

Filed Jun. 12, 1972, Ser. No. 262,076

Int. Cl.² H03B *19/00*

U.S. Cl. 331—1 A **13 Claims**



1. A frequency synthesizing system, comprising:

frequency synthesizing means operative to produce an adjustable intermediate frequency;

frequency dividing means connected to receive the intermediate frequency and to divide it by an adjustable division factor to produce an output frequency;

setting means operable to set up a desired value of the output frequency; and

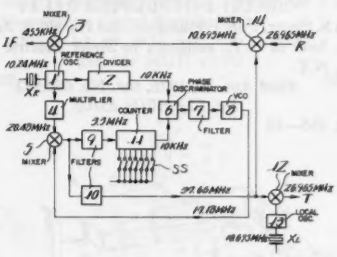
control means connected to the setting means to respond to the value of the output frequency set up thereby and also connected to the synthesizing means and the dividing means to control the values of the said intermediate frequency and of the division factor in dependence on the value of the output frequency set up, such that the value of intermediate frequency produces, when divided by the

division factor of the dividing means, the desired output frequency.

4,086,545
PHASE LOCKED LOOP TYPE TRANSMITTER RECEIVER

Toshihiko Teshirogi, Machida, Japan, assignor to Cybernet Electronic Corporation, Kawasaki, Japan

Filed Mar. 14, 1977, Ser. No. 777,360
Claims priority, application Japan, Apr. 7, 1976, 51-39048
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—16 **2 Claims**



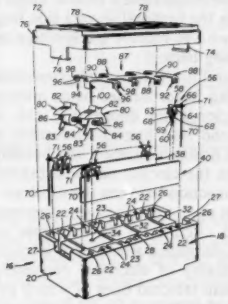
1. A phase locked loop type transmitter-receiver comprising:
a reference oscillator for generating a first frequency signal;
a fixed frequency divider connected to the reference oscillator;
a phase discriminator connected to the fixed frequency divider;
a low-pass filter connected to the phase discriminator;
a voltage controlled oscillator connected to the low-pass filter for generating a second frequency signal;
mixer means connected to the reference oscillator and to the voltage controlled oscillator for mixing the first and second frequencies to synthesize sum and difference signals therof;
a programmable counter connected between the mixer means and the phase discriminator for dividing the sum signal synthesized by the mixer means;
a transmitting side mixer connected to the mixer means to receive the sum signal synthesized by the mixer means for synthesizing a carrier wave for transmission; and
a receiving side mixer connected to the mixer means to receive the sum signal synthesized by the mixer means for synthesizing a local oscillation frequency for reception.

4,086,546
UNIVERSAL ATTENUATOR

William W. Fulp; Jack G. Nance, both of Winston-Salem; James L. Owens, Clemmons, and Theodore W. Robbins, Winston-Salem, all of N.C., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,402
Int. Cl.[2] H01P *1/22*
U.S. Cl. 333—81 R **17 Claims**

14. An attenuator for producing attenuation in transmission lines comprising:
a first support member having a plurality of channels formed therein;
a second support member which is assembled with the first support member;
a plurality of circuit substrate devices, each of which is positioned and supported in a respective channel in the first support member, and each of which has attenuating circuits formed thereon, the attenuating circuits of each circuit substrate device being selectively connectable for producing attenuation of variable preselected magnitudes in the respective transmission line;
a plurality of electrical connectors for providing selective coupling in the attenuating circuits of the circuit substrate devices;
a plurality of actuators mounted for movement on the first support member and positionable in at least first and second positions; and
a plurality of conductive shorting bar assemblies with each assembly including a pair of integrally formed shorting bars, each shorting bar assembly mechanically coupled to a corresponding one of the actuators with the pair of shorting bars of each assembly for electrically coupling

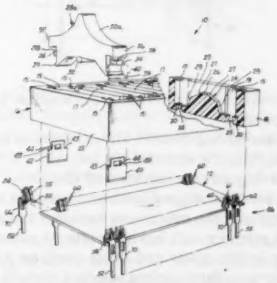


selected portions of a selected attenuating circuit on a respective one of the circuit substrate devices when the corresponding actuator is in the first position, and for electrically coupling selected portions of the selected attenuating circuit to a selected one of the plurality of electrical connectors when the actuator is in the second position so that upon selected movement of one of the plurality of actuators, the attenuating circuits of the corresponding circuit substrate devices are selectively connected to provide selected magnitudes of attenuation to the respective transmission lines.

4,086,547
SWITCHABLE ATTENUATOR

Jack G. Nance, Winston-Salem; James L. Owens, Clemmons, and Theodore W. Robbins, Winston-Salem, all of N.C., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,397
Int. Cl.[2] H01P *1/22*
U.S. Cl. 333—81 R **11 Claims**



11. An attenuator for providing attenuation in an external circuit comprising:
a substrate having circuits formed thereon for establishing predetermined amounts of attenuation in the external circuit;
a housing having openings formed therein;

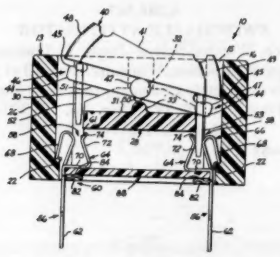
a partition formed in the housing;
a plurality of rocker arms mounted for movement on the partition and having upper portions thereof extending through the openings in the housing;
a plurality of pairs of conductive shorting bars with one bar of each of the pairs of bars mounted to a respective end of each rocker arm for coupling selected circuits on the substrate; and
a plurality of pairs of electrical connectors, one pair for each of the shorting bars, mounted on the housing on opposite sides of the partition;
each of the plurality of electrical connectors including first and second side fingers and a central finger aligned with a space between the first and second side fingers and cooperating therewith to receive a respective one of the conductive shorting bars;
each of the plurality of electrical connectors including a third projecting finger formed on an intermediate portion of the connector which cooperates with portions of the first and second side fingers to receive and retain the substrate in a position adjacent the housing and provide connections to the circuits on the substrate, and thereby provide a connection between the substrate and the shorting bar so that upon the selective movement of the rocker arms selected circuits on the substrate are coupled to establish predetermined amounts of attenuation;
each of the plurality of electrical connectors including a conductive stem selected ones of which provide connections between the substrate and the external circuit so that the predetermined amounts of attenuation established by the substrate are provided to the external circuit.

4,086,548

SWITCHABLE ATTENUATOR ASSEMBLY AND METHOD OF ASSEMBLING SAME

Theodore W. Robbins, and Raymond O. Terry, Jr., both of Winston-Salem, N.C., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,396
Int. Cl.² H01P 1/22; H01H 19/00, 1/42, 11/00
U.S. Cl. 333—81 R **20 Claims**



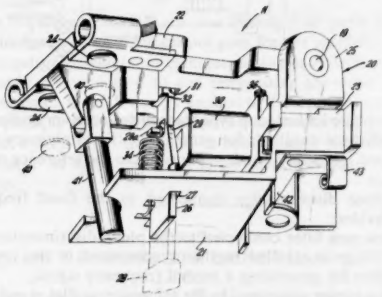
1. An attenuator for providing attenuation to an external circuit comprising:
circuit means having circuits formed thereon for establishing attenuation in the external circuit;
a cover having an opening formed therein;
a support member aligned with and coupled to the cover;
means, captured for movement between the cover and the support member and having portions extending into the opening in the cover and other portions adjacent to the circuit means, for coupling selected circuits on the circuit means;
a plurality of connector means;
each of the plurality of connector means having a first portion electrically securable to the circuit means for providing connections to the circuits on the circuit means;
each of the plurality of connector means having second portions aligned to receive portions of the coupling means for providing connections between the circuit means and the coupling means so that, upon selected movement of the coupling means to engage the second portion of selected ones of the plurality of connector means, selected circuits on the circuit means are coupled to establish predetermined amounts of attenuation; and
each of the plurality of connector means having a third portion selected ones of which are electrically securable to the external circuit for providing connections between the circuit means and the external circuit so that the predetermined amounts of attenuation established in the circuit means are provided to the external circuit.

4,086,549

CIRCUIT INTERRUPTER RELAY

Thomas S. Slater, Port Washington, and Harald B. Jadatz, Deer Park, both of N.Y., assignors to Slater Electric Inc., Glen Cove, N.Y.

Filed Apr. 28, 1976, Ser. No. 680,922
Int. Cl.² H01H 83/02
U.S. Cl. 335—18 **25 Claims**



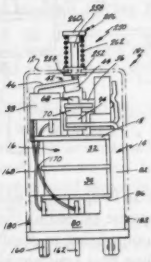
1. Circuit interrupter apparatus comprising:
a housing;
at least one stationary electrical contact fixedly mounted in said housing;
conductor means for coupling each said stationary contact to one of a source of electrical current and an electrical load;
a movable member pivotally mounted in said housing;
at least one first electrical contact mounted to said movable member, said first contact positioned on said movable member for mating engagement with said stationary contact;
conductor means for coupling each said first contact to the other of said current source and load;
an actuating member slidably and pivotally mounted in said housing and adapted for releasably engaging said movable member to bring said first and stationary contracts into mating engagement;
first biasing means coupled between said movable member and said housing adapted to resist mating of said first and stationary contacts;
second biasing means coupled between said actuating member and said housing and adapted to achieve said mating of said first and stationary contacts when said actuating member is engaged with said movable member;
release means suitably positioned in said housing near said actuating member for causing engagement between said actuating member and said movable member to be released, said release means coupled to sensing means adapted to detect predetermined circuit conditions for activiating said release means upon detecting the predetermined conditions, such that, when said sensing means detect the predetermined circuit conditions, said sensing means activates said release means for disengages said actuating and movable members to disengage the mated

first and stationary contacts, and, when re-mating is desired, said actuating member is manually translated by an operator while said second biasing means urges said actuating member to rotate into engagement with said movable member, and, after said actuating member has engaged said movable member, mating of said contacts is effected only when the actuating member has been released by said operator, said second biasing means causing, through the actuating member, said first and stationary contacts to mate.

4,086,550
RELAY

Gary L. Conner, Cedar Springs, Mich., assignor to U.S. Engineering Corporation, Grand Rapids, Mich.

Filed Oct. 15, 1976, Ser. No. 732,918
Int. Cl.[2] H01H *45/02*
U.S. Cl. 335—132 **20 Claims**



1. A modular constructed, solenoid actuated relay, comprising:

a terminal and solenoid module including a molded, plastic member defining a bobbin portion, a fixed upper relay terminal molded integral with said member and a solenoid winding supported on said bobbin portion;

a terminal and connector module snap-locked to said terminal and solenoid module, said terminal and connector module including a molded plastic member and a fixed lower relay terminal molded integral with said member;

a center terminal subassembly positioned between said upper and lower terminals and including a molded plastic carrier plate and a center terminal molded integral with said plate; and

a plunger subassembly connected to said carrier plate and including a core positioned within said bobbin portion of said terminal and solenoid module.

4,086,551
SHUNT POSITIONING DEVICE

Leonard S. Smith, Minneapolis, Minn., assignor to Century Mfg. Co., Minneapolis, Minn.

Filed Jun. 24, 1977, Ser. No. 809,544
Int. Cl.[2] H01F *21/06*
U.S. Cl. 336—45 **5 Claims**

1. A shunt positioning and locking means for a welding apparatus having in combination

a core having a primary and a secondary coil mounted therein in spaced relation,

shunt holding means moveably disposed between said coils,

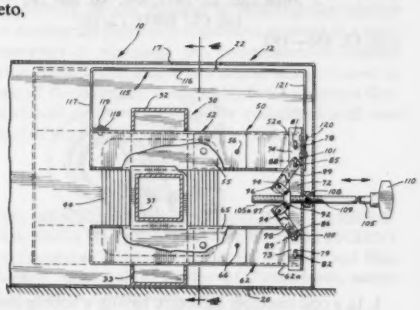
means formed by said core supporting said shunt holding means,

said shunt holding means comprising a pair of spaced frame members,

an elongated connecting member at one end of said frame members,

means moveably connecting said spaced frame members to said connecting member for movement of said frame members relative to said connecting member in directions toward or away from each other,

a rod disposed through said connecting member spaced between said frame members having axial movement normal to the plane of said connecting member relative thereto,



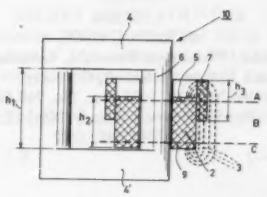
means linking said rod with each of said frame members moving said frame members toward and away from each other by axial movement of said rod and

said second mentioned means comprising surface portions opposed to each of the adjacent and to each of the remote sides of said frame members and each of said frame members having small clearance between their respective opposed surface portions.

4,086,552
HIGH-VOLTAGE TRANSFORMER COMPRISING A FOIL WINDING

Albertus Bernardus Antonius Baggermans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 623,315, Oct. 17, 1975, abandoned.
This application Feb. 24, 1977, Ser. No. 771,695
Claims priority, application Netherlands, Oct. 21, 1974, 7413744
Int. Cl.[2] H01F *21/04*
U.S. Cl. 336—119 **2 Claims**

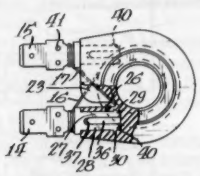


1. A high-voltage television line transformer tunable to a selected harmonic frequency of an input signal having a given frequency comprising, a ferromagnetic core including two yokes, two legs disposed between said yokes, at least one low-voltage foil winding disposed on one of the legs and adapted to receive said input signal, said foil winding having when energized substantially parallel magnetic field lines at its side and curved magnetic field lines at its end, and means for enabling tuning of said transformer to said selected frequency including a one high-voltage winding slidably disposed on the low-voltage winding, and wherein the length of the leg whereon the low-voltage winding and the high-voltage winding are disposed being substantially larger than the width of the foil winding and being less than the sum of the widths of the foil and high-voltage windings, thereby enabling the high-voltage winding to selectively engage the parallel and curved field lines.

4,086,553
COIL ASSEMBLY STRUCTURE

William F. Robandt, St. Joseph; Roger J. Cartier, Benton Harbor, and Sandy C. Gay, St. Joseph, all of Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jun. 13, 1977, Ser. No. 806,292
Int. Cl.[2] H01F 15/10
U.S. Cl. 336—192 3 Claims



1. In a coil assembly structure having a bobbin about which a wire coil is adapted to be wound, the improvement comprising:

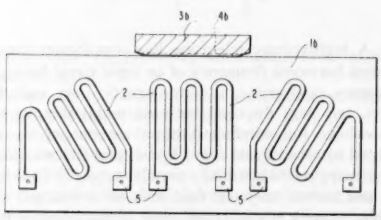
means defining a recess in fixed association with said bobbin, said recess being defined by opposed sidewalls, and an elongated, outwardly extending spreader element disposed in said recess intermediate said sidewalls and having substantially parallel side edges defining a substantially constant transverse extent of the spreader element along substantially its entire length, said spreader element extending a major portion of the depth of said recess; and

a terminal having inner end portions defining spaced coplanar flat locking portions straddling said spreader element and having inner edges slidably engaging said parallel side edges of the spreader element in said recess and having transversely outwardly projecting biting means projecting into said sidewalls, said locking portions being maintained substantially a preselected distance transversely apart by said spreader element to retain said biting means in said sidewalls at all positions substantially the length of said spreader element.

4,086,554
STRAIN GAUGE

Wolfgang Sieder, Waiblingen-Beinstein, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Nov. 10, 1976, Ser. No. 740,668
Claims priority, application Germany, Nov. 12, 1975, 2550669
Int. Cl.[2] G01L 1/22
U.S. Cl. 338—2 6 Claims

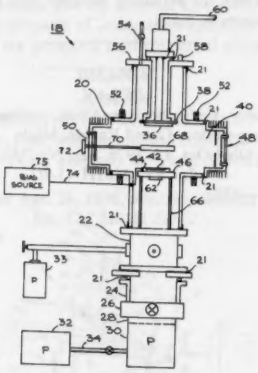


1. A strain gauge adapted to be adhesively mounted on a place to be tested, which includes a main carrier means and a measuring grid means having connecting ends for the connection thereto of measuring lines, characterized in that an extension of the carrier means is provided along one edge of the strain gauge, said extension being readily detachably connected with the main carrier means by a perforation.

4,086,555
PHOTOCONDUCTIVE SENSOR

Esther Krikorian, Claremont, and Michael J. Crisp, Placentia, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed May 27, 1976, Ser. No. 690,463
Int. Cl.[2] H01L 31/08
U.S. Cl. 338—15 15 Claims



1. An improved PbSnTe sputtered unannealed sensor having photoconductive response exceeding those of intrinsic PbSnTe sensors, said sensor comprising in combination:

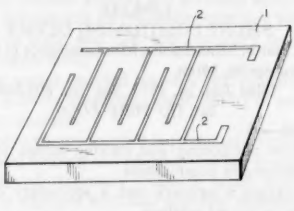
(a) a monocrystalline heat resistant substrate; and

(b) a thin sputtered unannealed monocrystalline film on said substrate and having the formula $Pb_{1-x}Sn_xTe$ where x is in the range from 0.0 to about 0.3, said film having a cutoff wavelength between about 6μm and about 15μm.

4,086,556
HUMIDITY SENSITIVE CERAMIC RESISTOR

Tsuneharu Nitta, Katano; Ziro Terada, Yao, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 2, 1976, Ser. No. 720,078
Claims priority, application Japan, Sep. 18, 1975, 50-113320; Sep. 30, 1975, 50-118368; Sep. 30, 1975, 50-118369; Sep. 30, 1975, 50-118370; Sep. 30, 1975, 50-118371
Int. Cl.[2] H01L 7/00
U.S. Cl. 338—35 30 Claims



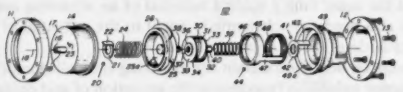
19. A humidity sensitive ceramic resistor comprising a ceramic plate having a conducting electrode secured to a surface thereof, said ceramic plate consisting essentially of, as solid ingredients, 60 to 99 mole percent of at least one main component having spinel-type cubic symmetry selected from the group consisting of $MgCr_2O_4$, $FeCr_2O_4$, $NiCr_2O_4$, $CoCr_2O_4$, $MnCr_2O_4$, $CuCr_2O_4$, Mg_2TiO_4, Mg_2SnO_4, and 1 to 40 mole percent of at least one additional metal oxide selected from the group consisting of SnO_2, ZrO_2 and HfO_2.

4,086,557

VARIABLE RESISTANCE PRESSURE TRANSDUCER

Kenneth Warren Padgitt, Arlington Heights, and Stanley Marion Kujawski, Lombard, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 6, 1976, Ser. No. 683,976
Int. Cl.[2] H01L 10/10
U.S. Cl. 338—42 20 Claims



1. An improved variable resistance device adaptable for use in a pressure transducer, said device comprising:

housing means for said variable resistance device;

at least one resistive element helically wound about a central axis, said resistive element having first and second end portions;

first and second electrical contacts electrically coupled to said first and second end portions of said resistive element, respectively;

at least one circular ring shaped electrical contact means positioned with its axis substantially coincident with said central axis, said ring contact means located between said first and second end portions and having a circular circumferential surface around said axis for electrically contacting said resistive element;

spring bias means for positioning one of said resistive element and said ring contact means along said central axis with respect to said housing means, the other one of said resistive element and said ring contact means being fixed with respect to said housing means;

said one of said resistive element and said ring contact means positioned by said spring bias means being directly linearly slideable with respect to said housing means in directions parallel to said central axis, and said ring contact means being positioned for electrically contacting said resistive element with its circumferential surface during relative movement of said ring contact means with respect to said resistive element in directions parallel to said central axis,

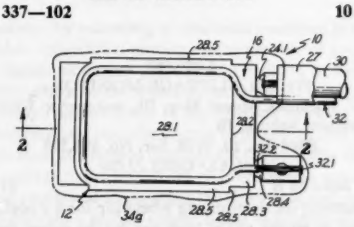
whereby the relative movement results in continuously moving the effective contact point of the ring contact means helically along the surface of the helical resistive element, therefore providing a high resolution, wide resistance range, variable resistance device usable with a linear actuation movement.

4,086,558

MOTOR PROTECTOR AND SYSTEM

Radi Pejouhy, Marshfield, and Joseph L. McMorrow, West Bridgewater, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 9, 1976, Ser. No. 656,459
Int. Cl.[2] H01H 37/52
U.S. Cl. 337—102 10 Claims



1. A motor protector comprising a metal housing, a first contact mounted within the housing, a complementary contact, a thermally responsive bimetallic element mounted within the housing for moving the complementary contact along a selected axis to engage and disengage the first contact in response to changes in temperature of the thermally responsive element, and electrical resistance heater coil means mounted externally of the housing in heat-transfer relation thereto for heating the thermally-responsive element to a sufficient temperature to disengage the complementary contact from the first contact, said heater coil means being oriented so that the axis of the magnetic field established by current flow in the heater coil means is substantially coincident with said axis of movement of the complementary contact.

4,086,559

ELECTRIC RESISTOR BASED ON SILICON CARBIDE HAVING A NEGATIVE TEMPERATURE COEFFICIENT

Wilhelmus Franciscus Knippenberg; Gerrit Verspui, and Siegfried Hendrik Hagen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 504,912, Sep. 11, 1974, abandoned. This application Sep. 22, 1975, Ser. No. 615,695
Claims priority, application Netherlands, Sep. 14, 1973, 7312740
Int. Cl.[2] H01C 7/04
U.S. Cl. 338—22 R 8 Claims

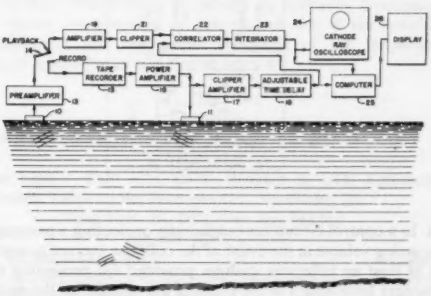
1. An electric resistor having a resistance body consisting of p-type doped pyrolytic polycrystalline cubic silicon carbide.

4,086,560

SECRET DEPTH SOUNDER

Thomas F. Johnston, Silver Spring, and Aaron Z. Robinson, Hyattsville, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 3, 1959, Ser. No. 804,053
Int. Cl.[2] G01S 9/66
U.S. Cl. 340—3 R 6 Claims



1. The method of measuring depth of a body of water comprising the steps of recording the natural ambient noises at the location where the depth is to be measured, projecting the recorded noises back into the surrounding body of water, receiving the reflection of said projected recorded noises, and

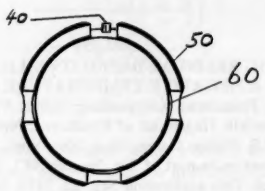
correlating the reflected noises with the projected recorded noises delayed in time.

4,086,561

MARINE SEISMOGRAPH CABLE BALANCING

Douglas William Wooddy, Jr., 134 Lafitte Dr., Waveland, Mich. 39576

Filed Jun. 17, 1976, Ser. No. 697,011
Int. Cl.[2] G01V *1/38*
U.S. Cl. 340—7 PC **4 Claims**



1. A cable weight for installation upon the exterior of a geophysical cable, comprising:

a plurality of weights of small size relative to the cross section of the geophysical cable, encased in and supported by an elongated section of heat shrinkable tubing; and

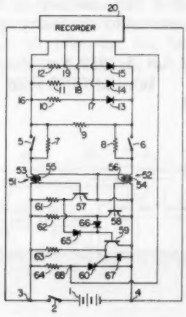
a fastenable band or strap inserted through said tubing section for securing said relatively small weights to the exterior or said geophysical cable, said cable weight being thereby relatively easy to fasten to and remove from said cable.

4,086,562

APPARATUS FOR RECORDING ERRONEOUS OPERATIONS OF PASSENGER PROTECTING APPARATUS FOR MOTOR VEHICLES

Akira Hasegawa, Katsuta, Japan, assignor to Hitachi, Ltd. and Nissan Motor Co., Ltd., both of, Japan

Filed Feb. 12, 1976, Ser. No. 657,597
Claims priority, application Japan, Feb. 17, 1975, 50-18822
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—52 H **13 Claims**



1. In a control circuit for confiningly protecting a passenger of a motor vehicle in the event of the collision thereof comprising at least an inflatable cushion provided for protecting the passenger from injury in the event of the collision of the motor vehicle, at least one actuating means having first and second terminals, for actuating said inflatable cushion, a d.c. current source having an anode and a cathode, and a collision force detector means for sensing said collision to connect said actuating means to said d.c. current source to thereby actuate said actuating means upon collision of the motor vehicle, the improvement residing in an apparatus for recording an erroneous operation of said control circuit, which improvement comprises

an actuation detection circuit for producing an actuation detection signal representing the actuation of said actuating means by detecting a state in which a first terminal of an actuating means is at a potential substantially equal to the potential of the anode of said d.c. current source and at the same time a second terminal of an actuating means is at a potential substantially equal to the potential of the cathode of said d.c. current source,

a collision detection circuit for detecting the collision of the motor vehicle in response to the actuation of said collision force detector means and storing the occurrence of the collision as a collision signal, and

a recorder adapted to be driven only when said actuation detection signal is produced by said actuation detection circuit and said collision signal is not stored in said collision detection circuit whereby the erroneous operation of said actuating means is recorded when no collision actually occurs, and wherein

said collision force detector means is composed of first and second collision force detecting switches each having first and second terminals, said first terminals being connected, respectively, to the anode and cathode of said d.c. current source,

said actuation detecting circuit is composed of first and second voltage divider resistors respectively connected in parallel to said first and second collision force detecting switches, a third voltage divider resistor connected between the second terminals of said first and second collision force detecting switches, and a plurality of diodes each having cathode connected in common to a junction between said second collision force detecting switch and said third voltage divider resistor and each having an anode connected to the first terminal of a respective actuating means, the second terminal of which is connected in common to a junction between said first collision force detecting switch and said third voltage divider resistor, and

said recorder is composed of a determining circuit for monitoring a plurality of monitor points formed by the junction between said actuating means and said first collision force detecting switch as well as anode-side junctions of said diodes, respectively, and serving to detect that at least one of said monitor points has a potential greater than a first predetermined reference potential and that at least another one of said monitor points has a potential lower than a second predetermined reference potential, a recording means, and a driving circuit adapted to be actuated by the output of said determining circuit to thereby drive said recording means.

4,086,563

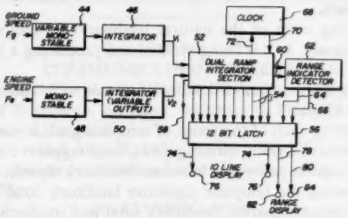
WHEEL SLIPPAGE MONITOR

Wesley J. Bachman, Mount Zion, Ill., assignor to Dickey-john Corporation, Auburn, Ill.

Filed Jul. 10, 1975, Ser. No. 594,599
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—52 B **17 Claims**

1. A monitor for determining wheel slip for a wheeled vehicle having an engine and at least one driving wheel and being driven by the engine over the ground comprising means providing an electrical signal related to the speed of said engine, means providing an electrical signal related to the ground speed of said vehicle, means connected with both of said signal

providing means and including dual ramp integrator means for comparing said signals and providing an electrical output



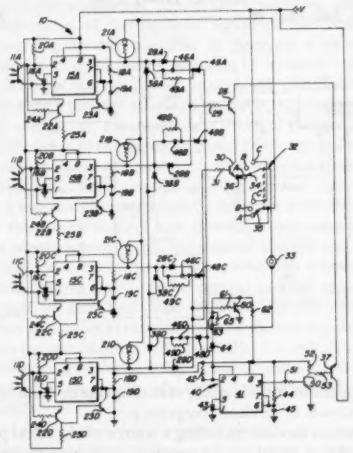
according thereto, and perceptual means connected to and operated by said electrical output.

4,086,564

ELECTRONIC ALARM CIRCUITRY

William Eugene Claxton, Mogadore, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 27, 1975, Ser. No. 581,392
Int. Cl.[2] B60C *23/02*
U.S. Cl. 340—58 **21 Claims**



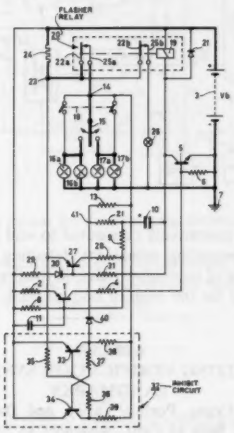
1. Apparatus for indicating an abnormal condition in a rotatable member comprising, sensing means capable of providing periodic signals indicative of a normal condition of the rotatable member, the absence of said periodic signals being indicative of an abnormal condition of the rotatable member, timing means receiving said periodic signals to provide a first output signal indicative of a normal condition of the rotatable member as long as said periodic signals are received within a predetermined time period and recognizing the absence of said periodic signals to provide a second output signal indicative of an abnormal condition of the rotatable member, and indicator means receiving said first and second output signals of said timing means and indicating the abnormal condition upon the occurrence of a said second output signal.

4,086,565

AUTOMOTIVE ELECTRONIC FLASHER UNIT

Bruno Schorter, Morsang, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 7, 1976, Ser. No. 720,808
Claims priority, application France, Sep. 16, 1975, 75 28355
Int. Cl.[2] B60Q *1/38*
U.S. Cl. 340—81 R **11 Claims**



1. An automatic electronic flasher unit for vehicle direction indicator lamps comprising, a terminal for supplying DC operating voltage to the flasher unit, a switch connected in circuit to selectively operate the indicator lamps, an electromagnetic relay having at least one set of contacts connected in circuit with said switch and said indicator lamps to the DC supply terminal so as to intermittently supply a current to selected ones of the indicator lamps upon operation of said switch, an astable multivibrator including at least one transistor for controlling the flashing frequency of the indicator lamps, first means connecting the astable multivibrator to the relay to control the relay operation, a resistor having a low resistance value connected between the supply terminal and one contact of the relay, a bistable multivibrator including first and second cross-coupled transistors connected as an inhibit circuit so as to inhibit operation of the astable multivibrator, a frequency changer transistor having an input electrode and an output electrode, second means connecting the end of said resistor which is connected to the one relay contact to the base of the first transistor of the bistable multivibrator and to the input electrode of said frequency changer transistor, a timing network including a capacitor and coupled to the one transistor of the astable multivibrator to control its operating frequency, and means for coupling an output terminal of the bistable multivibrator and the output electrode of the frequency changer transistor to said timing network.

4,086,566

ERROR DETECTOR FOR MODIFIED DUOBINARY SIGNALS

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

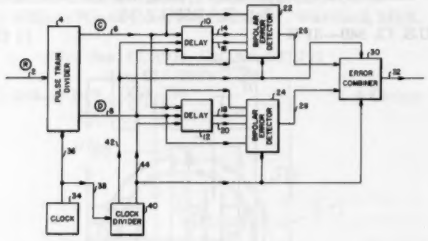
Filed Nov. 15, 1976, Ser. No. 742,168
Int. Cl.[2] G06F *11/00*
U.S. Cl. 340—146.1 AB **8 Claims**

1. An error detector for detecting errors in a modified duobinary pulse train, which comprises:

means for converting the modified duobinary pulse train into a first unipolar pulse train representing the positive pulses at a first output, and a second unipolar pulse train representing the negative pulses at a second output;

delay means for providing a first delayed representation of

the first and second unipolar pulse trains for only the odd bit times, and a second delayed representation of the first and second unipolar pulse trains for only the even bit times; and



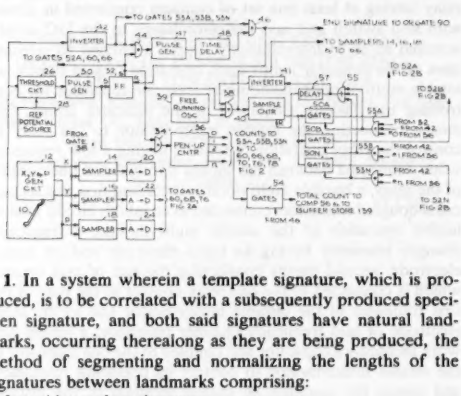
logic means operatively connected to said delay means and to said converting means for detecting coincidences of occurrence of successive pulses in the first or second pulse trains only for the even or odd bit times.

4,086,567

HANDWRITING VERIFICATION SYSTEM USING LANDMARKS

Hewitt David Crane, Portola Valley, and Daniel Errol Wolf, Menlo Park, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Aug. 20, 1976, Ser. No. 716,344
Int. Cl.[2] G06K 9/00
U.S. Cl. 340—146.3 SY **10 Claims**



1. In a system wherein a template signature, which is produced, is to be correlated with a subsequently produced specimen signature, and both said signatures have natural landmarks, occurring therealong as they are being produced, the method of segmenting and normalizing the lengths of the signatures between landmarks comprising:

for said template signature;

generating a plurality of trains of signals, as said template signature is being produced, each train representing a different parameter of said template signature,

sampling each train of signals to provide a train of sample signals,

detecting each of the natural landmarks in said template signature, as it is being produced and producing a landmark signal for each,

adding the number of landmark signals to produce a landmark total,

separating each of the trains of sample signals in response to landmark signals, into segments, each segment comprising the sample signals generated between landmark signals,

counting the number of sample signals in each segment, to provide a total number of sample signals for each segment, for said specimen signature,

generating a plurality of trains of signals, each train representing a different parameter of said specimen signature but corresponding to a parameter of said template signature,

sampling each train of signals to provide a train of sample signals,

detecting each of the natural landmarks in said specimen signature, as it is being written and producing a landmark signal for each,

adding the number of landmark signals to produce a landmark total,

separating each of the trains of sample signals in response to landmark signals, into segments, each segment comprising the signals generated between landmark signals,

comparing the template signature landmark total with the specimen signature landmark total and producing a true signal if they are alike,

in response to said true signal, for each identical parameter of said specimen and template signature,

deriving from each entire segment of each said specimen signature signal train substantially the same number of sample signals as the total number of sample signals for each corresponding segment of a corresponding template sample signal train, and

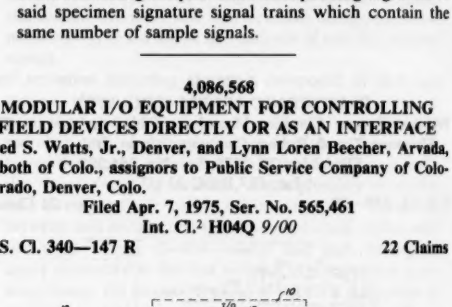
correlating said segments of said template signature signal trains containing samples with corresponding segments of said specimen signature signal trains which contain the same number of sample signals.

4,086,568

MODULAR I/O EQUIPMENT FOR CONTROLLING FIELD DEVICES DIRECTLY OR AS AN INTERFACE

Fred S. Watts, Jr., Denver, and Lynn Loren Beecher, Arvada, both of Colo., assignors to Public Service Company of Colorado, Denver, Colo.

Filed Apr. 7, 1975, Ser. No. 565,461
Int. Cl.[2] H04Q 9/00
U.S. Cl. 340—147 R **22 Claims**



1. Apparatus for selectably actuating one or more of a plurality of subsets of devices comprising:

a function module including a source of electrical power, an enabling signal output terminal, switching means for producing an output signal, and

a plurality of control modules each including linking circuit means having normally coupled input and output terminals adapted for connection in serial circuit relation with other said control module linking circuit means and said function modules enabling signal output terminal, each said control module further having means selectably actuable in the presence of said enabling signal at said input terminal, power diversion means responsive to operation of said selectably actuable means for disconnecting said linking circuit means output terminal from said input terminal, said power diversion means including means for connecting said electrical power source to a respective subset of the plurality of devices, whereby operation of said selectably actuable means disables any other said

control module having said linking circuit means thereof coupled downstream in said serial circuit relation from said function module enabling signal output terminal.

4,086,569

COMMUNICATION SYSTEMS

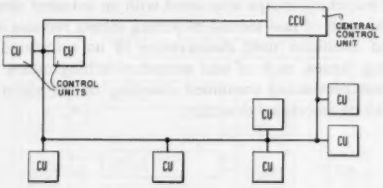
Brian Edward Pitches, and Robert Malcolm Stuart Murray, both of Edinburgh, Scotland, assignors to Ferranti Limited, Hollinwood, England

Filed Aug. 27, 1976, Ser. No. 718,335

Claims priority, application United Kingdom, Aug. 30, 1975, 358571/75

Int. Cl.[2] H04Q *11/00*

U.S. Cl. 340—167 R **12 Claims**



1. A communication system for providing communication between a central control unit and a plurality of controlled units over a single communication channel linking all of the units which includes, at the central control unit, clock generator means operable to generate a periodic signal, timing means for generating a repetitive sequence of time intervals each of which is allocated for communication between the central control unit and a different one of the controlled units only during half-cycles of the periodic signal of one polarity, a control word generator operable to generate a number of control words, control means operable to transmit a selected control word to the designated controlled unit during part only of each time interval allocated to that controlled unit, data receiving means for receiving data from a controlled unit during half-cycles of the periodic signal of the opposite polarity, and display means for displaying such received data; and at each controlled unit, a control word generator operable to generate a number of control words different from those generated in the central control unit, control means responsive to a control word received from the central control unit during the time interval allocated to that controlled unit to transmit an appropriate control word to the central control unit during another part of each said time interval, register means for storing data generated at the controlled unit, and data transmitting means for transmitting said data to the central control unit during half-cycles of the periodic signal of said opposite polarity on receipt of an appropriate control word from the cental control unit.

4,086,570

CONTROLLED DC CURRENT SUPPLY DEVICE WITH OPEN CIRCUIT DETECTING MEANS

Yutaka Wakasa, and Hisayuki Uchiike, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Apr. 8, 1976, Ser. No. 674,915

Claims priority, application Japan, Apr. 21, 1975, 50-48451

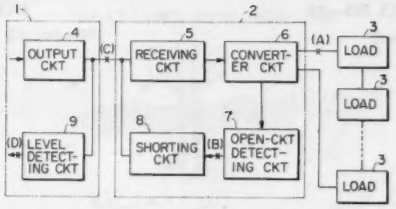
Int. Cl.[2] H04Q *9/16*

U.S. Cl. 340—172 **5 Claims**

1. In a control system of the type comprising controller means for providing a control signal on a signal line, and DC output means for converting the control signal on the signal line into a DC current output signal for supply to a current loop including one or more load devices, the improvement which comprises:

open-circuit detecting means for detecting an open circuit condition in the load current loop;

shorting means in the DC output means for shorting the signal line in response to detection of an open-circuit by the open circuit detecting means; and



level detecting means for detecting the shorting of the signal line;

whereby an indication of an open-circuited load condition may be supplied back to the controller means without use of an added signal carrying line.

4,086,571

MAGNETIC BUBBLE DOMAIN GENERATOR AND ANNIHILATOR

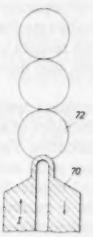
David Carl Bullock, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 499,823, Aug. 23, 1974, Pat. No. 4,040,019.

This application Feb. 24, 1977, Ser. No. 771,702

Int. Cl.[2] G11C *19/08*

U.S. Cl. 365—36 **5 Claims**



1. A magnetic memory, comprising

a magnetic garnet epitaxial layer,

the upper surface portion of said magnetic layer having a pattern formed therein defined by regions of two different types,

the first of said regions including at least one row of contiguous regions,

the second of said regions being ion-implanted regions, the edges of which adjacent to said first regions form rails to which magnetic domains adhere and along which the magnetic domains may be propagated,

means operably coupled to said magnetic garnet layer for controllably positioning magnetic domains with respect to said row, said means including dc field bias means,

a conducting loop in contact with one of said regions included in said row, and

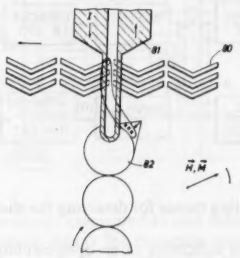
means connected to said conducting loop for generating a current therethrough, a current pulse reducing said dc bias field below a predetermined value generating a domain and a current pulse raising said dc bias field above a predetermined value annihilating a domain within said conducting loop.

4,086,572

MAGNETIC BUBBLE DOMAIN REPLICATOR

David Carl Bullock, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 499,823, Aug. 23, 1974. This application Feb. 23, 1977, Ser. No. 771,293
Int. Cl.[2] G11C 19/08
U.S. Cl. 365—12 5 Claims



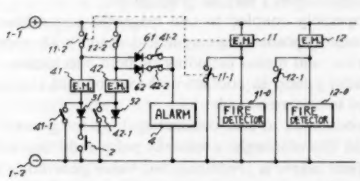
1. A magnetic memory, comprising
a non-magnetic substrate,
a magnetic garnet epitaxial film secured to said substrate,
the upper surface portion of said magnetic film having a pattern formed therein defined by regions of two different types,
the first of said regions including at least one row of contiguous regions,
the second of said regions being ion-implanted regions, the edges of which adjacent to said first regions form rails to which magnetic domains adhere and along which the magnetic domains may be propagated,
a Permalloy propagation path aligned transversely with respect to said row, said Permalloy propagation path including a plurality of separate Permalloy elements,
means coupled to said substrate for controllably positioning magnetic domains with respect to said row and said Permalloy propagation path, said means including dc field bias means,
a conducting loop in contact with one of said regions included in said row, the sides of said loop also respectively in contact with consecutive Permalloy elements of said Permalloy propagation path, and
means connected to said conducting loop for generating a current therethrough, a current pulse reducing said dc bias field below a predetermined value when a domain is within said conducting loop causing domain replication.

4,086,573

ALARM CONTROL DEVICE

Isao Sasaki, Tokyo, Japan, assignor to Nittan Company, Japan

Filed Oct. 31, 1975, Ser. No. 627,609
Claims priority, application Japan, Nov. 20, 1974, 49-139562[U]; Nov. 20, 1974, 49-139563[U]
Int. Cl.[2] G08B 23/00
U.S. Cl. 340—213 R 3 Claims



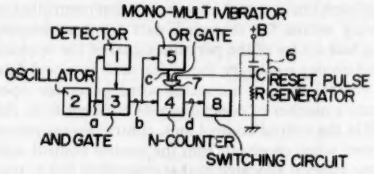
1. An alarm control device comprising a plurality of detecting means connected between two terminals of an energy source for detecting emergency conditions, each of said detecting means including first switching means actuated by said detecting means and having self-holding means, second switching means interconnected with said first switching means and including both selfholding means and alarm actuating circuit means interconnected with one of said terminals, a connection between said alarm actuating circuit means and said first switching means to connect said alarm actuating circuit to the other of said terminals upon actuation of said first switching means, an alarm connected in common with each of said alarm actuating circuit means of said second switching means and said one of said terminals, said alarm being actuated upon actuation of said first switching means through said alarm actuating circuit means of said second switching means, common switching means interconnected with each of said second switching means and operable to temporarily actuate each of second switching means associated with an actuated detector whereby each of said second switching means remains in the actuated condition until deactivation of its associated first switching means, each of said second switching means upon activation preventing continued sounding of the alarm produced by its associated detector.

4,086,574

FIRE DETECTION SYSTEM

Atsushi Miyabe, Yokohama, Japan, assignor to Hochiki Corporation, Japan

Filed Jul. 22, 1976, Ser. No. 707,608
Claims priority, application Japan, Jul. 25, 1975, 50-90057
Int. Cl.[2] G08B 17/00
U.S. Cl. 340—227 R 4 Claims

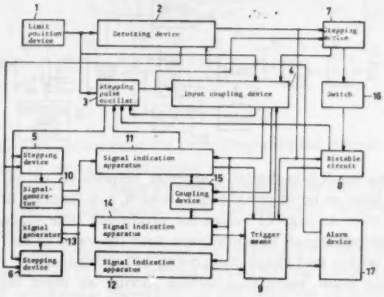


1. A fire detecting system comprising:
a fire-detection means for production of an output upon detection of a fire;
an oscillator means for supplying a series of oscillator pulse signals;
an AND circuit means having a first input connected to said fire-detection means and a second input connected to said oscillator for producing an alarm pulse when both of said fire-detection means output and said oscillator pulse signal are present;
a counting means having an input connected to said AND circuit means, for receiving said alarm pulses and producing an output after receiving a predetermined number of said alarm pulses;
an observation time control means responsive to said oscillator means and coupled to said counting means for generating an observation time of predetermined length starting upon generation of an oscillator pulse by said oscillator means and resetting said counting means at the end of said observation time; and
a fire warning means connected to said counting means for generating fire warning upon receipt of the output from said counting means.

4,086,575
APPARATUS FOR THE OPTIONAL DETECTION OF THE MOVEMENT OF ANY INDIVIDUAL OR ANY OPTIONAL PAIR OF OBJECTS

Sten-Åke Rydborn, Olaus Kloxhultsvagen 21, Almhult, Sweden

Filed Oct. 16, 1975, Ser. No. 623,200
Claims priority, application Sweden, Dec. 2, 1974, 7415050
Int. Cl.[2] B65H *63/00;* G08B *21/00*
U.S. Cl. 340—259 12 Claims



1. Apparatus for detecting whether one object selected from a number of objects is in motion, while no other object of said number of objects is in motion, or whether a set of objects selected from a number of sets of objects, each having two or more objects, is in motion, while no other set is in motion, said apparatus comprising:

a plurality of signal generating means, one signal generating means uniquely associated with each object to be detected, each signal generating means generating an electric signal in response to detection of movement of its associated object, said plurality of signal generating means being grouped in a plurality of groups, each group including a plurality of signal generating means;

a plurality of stepping means, one stepping means uniquely associated with each group of signal generating means, each stepping means capable of being stepped through a plurality of positions in each of which the stepping means is electrically connected to a unique one of the signal generating means in the associated group;

means for stepping said plurality of stepping means through the plurality of positions;

a plurality of indicating means, one indicating means uniquely coupled to each of said groups of signal generating means; and

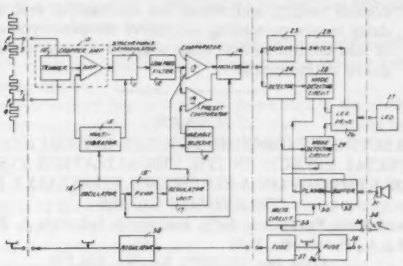
a further indicating means coupled to every group of signal generating means;

each stepping means including means electrically connecting the signal generating means of the position to which the stepping means is stepped to the associated one of said plurality of indicating means, for indicating generation of an electric signal by the signal generating means upon detection of movement of its associated object, and electrically connecting other signal generating means in the associated group to said further indicating means, for indicating generation of an electric signal by one of said other signal generating means upon detection of movement of the associated object.

4,086,576
AXLE LOAD MONITORING SYSTEMS

Alan Jebb, Keston; James George Arthur Rees, Bromley, and Raymond Lawrence, Maidstone, all of England, assignors to C. L. Instruments Limited, England

Filed Nov. 20, 1975, Ser. No. 633,958
Claims priority, application United Kingdom, Nov. 27, 1974, 51263/74
Int. Cl.[2] G08B *21/00;* B60R *27/00*
U.S. Cl. 340—272 25 Claims

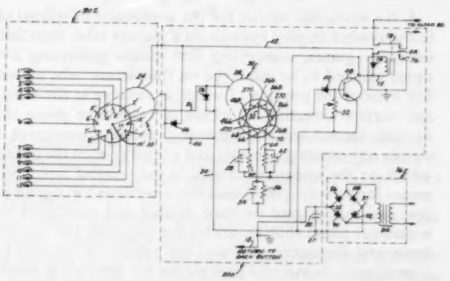


1. A load monitoring system for a road vehicle, said system comprising at least one load monitoring device for mounting on an axle of the vehicle so as to measure the deflection of the axle when under load, at least one pair of strain gauge elements forming each load monitoring device, the strain gauge elements of each pair being arranged to measure strain in different directions, an amplifier connected to said at least one load monitoring device and adapted to emit a signal dependent upon the load, a comparator circuit connected to the amplifier and an alarm, the comparator circuit being arranged to activate the alarm should the signal received from the amplifier exceed a predetermined value.

4,086,577
GUARD MONITOR SYSTEM

Henry J. Elgersma, 4631 Northview NE., Grand Rapids, Mich. 49505

Filed Jul. 14, 1975, Ser. No. 595,558
Int. Cl.[2] G07C *1/20*
U.S. Cl. 340—306 17 Claims



1. A guard tour system including a plurality of guard stations and a central control coupled to said guard stations for receiving and recording signals indicating the actuation of switch means at each of the guard stations by a guard on tour said system comprising:

a plurality of guard station switch means for guard stations to be actuated by a guard at a station; and

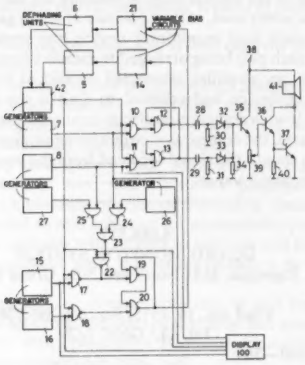
a control system including first switch means for responding to activation of one of said plurality of guard station switch means and for sequencing to another of said plurality of guard station switch means in response to activation of one of said plurality of guard station switch means;

means for sequentially coupling said first switch means to each of said switch means associated with the guard stations; power supply means coupled to said first switch means; a control switch and biasing delay means coupled to said control switch for actuating said control switch; said biasing delay means sequentially coupled to and uncoupled from said control switch by said first switch means so said control switch is momentarily actuated to close by the actuation of said first switch means; recording means; means coupling said recording means to said control switch for recording each of the actuations of said control switch; and means for deactuating said biasing delay means permitting successive momentary actuation of said control switch when a guard actuates a different guard station means.

4,086,578
ELECTRONIC CIRCUITS FOR THE GENERATION OF SPECIAL EFFECTS IN THE VISUALIZATION SYSTEM OF SYMBOLS ON A KINESCOPE ESPECIALLY FOR TELEVISION GAMES

Dino Masili, Pordenone, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy

Filed Jun. 20, 1975, Ser. No. 588,779
Claims priority, application Italy, Jul. 23, 1974, 45731/74
Int. Cl.[2] G08B *5/36*
U.S. Cl. 340—324 AD **5 Claims**

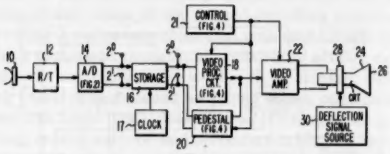


1. An electronic circuit for the generation of special effects in the symbol display systems on a picture tube, especially for television games, comprising first means generating a video signal adapted to be displayed on the picture tube screen as a first symbol the position of which is variable in the horizontal and vertical direction by means of respective phase shifting devices, second and third means generating respective video signals representing a second and a third symbol the position of which on the screen is variable in the vertical direction, first means for detecting the coincidence between the signals of said first and said second or third symbol and associated to said horizontal phase shifting device for inverting the direction of horizontal displacement of said first symbol in response to said coincidence, fourth and fifth means for generating respective video signals representative of a fourth and a fifth symbol having a fixed position on the screen, and a second means for detecting the coincidence between the signals of said first and said fourth or fifth symbol and associated to said vertical phase shifting unit for inverting the direction of the vertical displacement of the first symbol aforesaid, characterized in that it comprises in addition further means for generating a signal representing a portion of said second and third symbol, said further generating means being associated to the output of said first, second and third generating means as well as to said second detecting means, this latter being adapted to produce through said vertical phase shifting device a control signal for the reversal of the vertical displacement of said first symbol in response to the coincidence of said signal representative of the first symbol and of said signal representative of said portion of the second or the third symbol.

4,086,579
VIDEO DIGITAL DISPLAY DEVICE WITH ANALOG INPUT

Finis Claude Easter, Canoga Park, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Sep. 10, 1976, Ser. No. 721,980
Int. Cl.[2] G06K *15/20*; H03K *13/02*
U.S. Cl. 340—324 AD **13 Claims**



1. An analog-to-digital converter responsive to an input signal from an input signal source which, as a function of time, varies over a range of values for producing time spaced discrete output signals in accordance with the value of said input signal within said range comprising in combination:

a sole input amplifying device having an input terminal coupled to receive said input signal and an output terminal;

a plurality, X, of resistive potential divider networks dividing by different factors, each having a pair of input terminals and an output terminal, one input terminal of which is coupled to said output terminal of said amplifying device; the other input terminal of which is coupled to a common source of potential; and

a like plurality, X, of transistor means each having a principal conductive path between first and second electrodes, the conductivity of which is controlled responsive to potential appearing between said first electrode and a control electrode, said first electrode being connected to an output terminal of a respective one of said potential divider networks, said control electrodes being connected to a common source of potential, signals at said respective second electrodes being representative of different ranges within said range of values.

6. A video display device including a display screen responsive to an input signal at various values for correspondingly displaying related levels of brightness on related portions of the screen and which screen includes at least a portion which is dark comprising in combination:

means normally setting said input signal to a value corresponding to a screen level below the threshold of visibility;

means responsive to said input signal being at a value corresponding to any level of brightness on said screen for producing a first signal which will cause said screen to rise to the threshold of visibility;

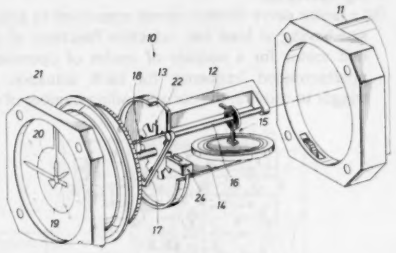
means responsive to said input signal being at a value corresponding to any level of brightness on said screen for producing a second signal which when additively mixed with said first signal causes said screen to exhibit a brightness level which level is a function of the value of said input signal;

additive mixing means responsive to said first and second signals for summing said signals and for applying the summed signal to said display screen for causing appropriate portions of said screen to exhibit various levels of brightness only when an input signal corresponding to some brightness level is present, other portions of said screen being dark.

4,086,580
DIGITAL ALTITUDE ENCODER

Rondon L. Schroeder, 1717 S. Topeka, Wichita, Kans. 67211

Filed Dec. 18, 1975, Ser. No. 641,992
Int. Cl.[2] G01D 5/34; H03K 13/02
U.S. Cl. 340—347 P 13 Claims



1. An altitude encoder for providing a digital output representative of altitude, comprising

an altimeter responsive to atmospheric pressure for rotating a shaft in correlation with the measured atmospheric pressure,

first signal generating means cooperating with the shaft for producing first and second signals having a relative time of occurrence dependent on the direction of rotation of the shaft,

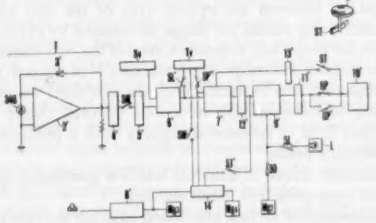
switch means presettable to a predetermined position representative of a preselected function of altitude, and

counting and code conversion means connected to the switch means for presetting the counting and code conversion means to a predetermined digital count representative of a preselected pressure altitude, the counting and code conversion means receiving the first and second signals and in response to the relative time of occurrence of the first and second signals increasing or decreasing the predetermined digital count preset in the counting and code conversion means in response to changes in altitude, and converting the digital count signals to a parallel digital code acceptable for transmission of aeronautical altitude information.

4,086,581
EXPOSURE CONTROL APPARATUS

Fumio Ito; Tadashi Ito, both of Yokohama; Yukio Mashimo, Tokyo; Nobuaki Sakurada, Yokohama, and Nobuhiko Shinoda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 6, 1975, Ser. No. 584,297
Claims priority, application Japan, Jun. 10, 1974, 49-65823
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—23 D 5 Claims



1. An exposure control apparatus comprising:

(a) light measuring means which measures brightness information of an object and provides a digital signal proportional thereto as an output;

(b) shutter speed setting means which provides a digital signal proportional to the shutter speed information as an output;

(c) diaphragm means which provides a diaphragm aperture for obtaining a correct exposure corresponding to the input signals of the light measuring means and the shutter speed setting means;

(d) diaphragm control signal forming means which is responsive to the diaphragm means and provides a digital signal corresponding to the diaphragm aperture provided by the diaphragm means;

(e) computing means which receives the photographic information of the light measuring means and shutter speed setting means;

(f) shutter control means which is connected to the shutter speed setting means and controls the shutter opening time in correspondence to the output of the shutter speed setting means;

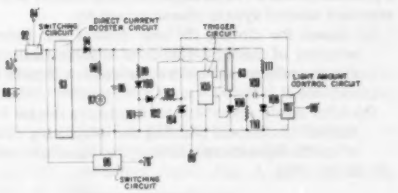
(g) comparing means which compares the digital output values of the diaphragm control signal forming means and the computing means and generates a signal when the output values coincide; and

(h) arresting means which is operatively connected to the diaphragm means, the diaphragm control signal forming means and the comparing means, and stops the output of the diaphragm control signal forming means by the output signal of the comparing means to determine the opening position of the diaphragm means.

4,086,582
EXPOSURE CONTROL DEVICE FOR A CAMERA

Takehiko Kiyohara, Zama; Tokuichi Tsunekawa, Yokohama; Mutsunobu Yazaki, Yokohama; Noriaki Sanada, Yokohama; Tetsuya Taguchi, Kawasaki, and Zenzo Nakamura, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 5, 1976, Ser. No. 711,968
Claims priority, application Japan, Aug. 8, 1975, 50/96488
Int. Cl.[2] G03B 15/05
U.S. Cl. 354—33 5 Claims



1. An exposure control device of a camera comprising:

light measuring means to measure object brightness and for generating an electric signal corresponding to an object brightness;

level signal generation means for generating an electrical signal with a preset level;

comparison means to compare the signal output of said light measuring means and the signal output of the level signal generation means, wherein said comparison means provides an electrical signal when the difference between said signal output values reaches a prescribed value;

flash emitting means for making flash light emission;

flash action preparation means for making flash action preparation of said flash light emitting means, wherein said preparation means starts the light emission preparation by the output signal of said comparison means and generates an electrical signal upon completion of the light emission preparation;

exposure time control means, which has a first time forming means being normally operable and a second time forming

means becoming operable by the signal output of said flash action preparation means, wherein said first time forming means conducts such exposure time control as corresponding to the signal output of the light measuring means while the second time forming means conducts exposure time control with a predetermined time, and

a shutter having its opening time controlled by one out of the first time forming means and the second time forming means, wherein said shutter is activated in an association with the release action, whereby flashing action of the flash light emitting means is made.

4,086,583

LIGHT SOURCE AND EXPOSURE CONTROL DEVICE FOR ENDOSCOPIC PHOTOGRAPHY

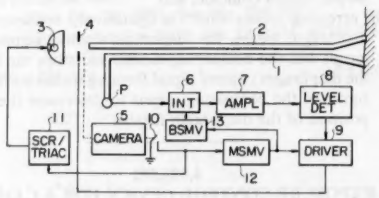
Nagashige Takahashi, No. 4-1, Nishi-machi, Kokubunji-shi, Tokyo, Japan

Filed Mar. 22, 1977, Ser. No. 780,158

Claims priority, application Japan, Mar. 24, 1976, 51-35604[U]

Int. Cl.² G03B *29/00*; A61B *1/06*

U.S. Cl. 354—62 **6 Claims**



1. In an endoscopic photography system including a light source, an endoscope, a side shutter disposed between the light source and a light inlet of said endoscope, a camera disposed adjacent a light outlet of said endoscope, a photosensitive element disposed adjacent said light outlet, circuit means for integrating the output of the photo-sensitive element, and circuit means for detecting when the integration value reaches a predetermined level, an improved side shutter and automatic exposure control system characterized by:

(a) means for closing the side shutter and increasing the intensity of the light source in synchronization with the camera release and before the camera shutter is opened, and

(b) delay means responsive to the camera release for opening the side shutter and enabling the integrating circuit means when the light source intensity has reached a stable, maximum value.

4,086,584

EXPOSURE RANGE CHANGEOVER CIRCUIT FOR MOTOR DRIVEN PHOTOGRAPHIC CAMERA

Susumu Kozuki, Yokohama; Toshikazu Ichiyanagi, Tokyo; Yoshiaki Watanabe, Fujisawa; Takashi Uchiyama, Yokohama, and Akio Sunouchi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,798

Claims priority, application Japan, Aug. 9, 1975, 50/96910

Int. Cl.² G03B *7/08, 1/18*

U.S. Cl. 354—38 **20 Claims**

1. A motor driven photographic camera having an automatically operated exposure mode selection switching circuit comprising in combination:

(A) a camera body having:

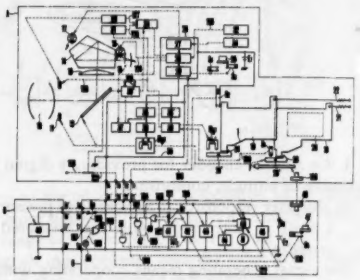
(a) a light measuring circuit for producing an output corresponding to the level of brightness of a scene being photographed; and

(b) an exposure control circuit receptive of the output of said light measuring circuit and selectively operating in either of a shutter preselection automatic exposure mode and a diaphragm preselection automatic exposure mode; and

(B) a motor drive circuit regulating at least the film winding operation of said camera, said circuit having:

(a) an electric motor for controlling at least the film winding operation;

(b) a motor drive control circuit connected to said motor and having at least two selective functions of driving said motor for a number of cycles of operation at a predetermined frequency for each actuation of the trigger to result in the corresponding number of succes-



sive frame exposures and of driving said motor for only one cycle of operation for each actuation of the trigger to result in a single frame exposure;

(c) motor function selecting means connected to said motor drive control circuit to select either of the continuous exposure function and the single exposure function; and

(d) exposure mode changeover means connected in said exposure control circuit and responsive to the actuation of said function selecting means upon selection of the continuous exposure function to automatically switch said exposure control circuit to the shutter preselection automatic exposure mode.

4,086,585

SYSTEM AND CAMERA FOR CONTROLLING DEPTH OF FIELD IN THREE-DIMENSIONAL PHOTOGRAPHY

Allen Kwok Wah Lo, and Jerry Curtis Nims, both of Dunwoody, Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Filed Dec. 27, 1976, Ser. No. 754,739

Int. Cl.² G03B *35/08*

U.S. Cl. 354—115 **9 Claims**

1. A system for producing stereoscopic pictures in general photography, comprising:

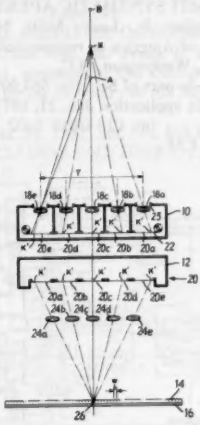
a camera for recording a plurality N of two-dimensional views of an object field, said camera including a corresponding plurality N of lenses aligned in a straight path with their optical axes substantially in parallel and the spacing between the optical axes of the two endmost lenses being within the range determined by $cF(N-1)/f$;

means for projecting respective ones of the two-dimensional views from a corresponding plurality N of aligned, spaced projecting lens locations, with the projected image from each two-dimensional view of a selected object in the object field in substantial registry with a predetermined reference point;

a lenticular screen of lenticule width w positioned opposite said projecting lens locations; and

a photosensitive surface positioned adjacent the rear surface of said lenticular screen, where c is within the range of from substantially 1.0 to substantially 5.0 where w is greater than 5 mils and is within the range of from substan-

tially 1.0 to substantially 10.0 where w is 5 mils or less, f is an f-number at least as high as the highest f-number provided by the lenses, and F is the effective focal length of the lenses.

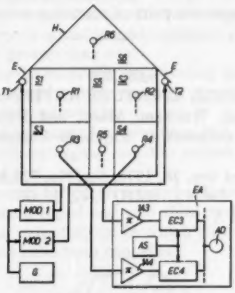


4,086,586

CLOSED SPACE INTEGRITY

Ernst Spirig, Movenstrasse 37, CH-8640 Rapperswil, Switzerland

Filed Aug. 2, 1976, Ser. No. 710,656
Int. Cl.[2] G08B *13/16*
U.S. Cl. 340—258 B **7 Claims**



1. In closed space integrity supervision equipment for supervising the integrity of a space enclosed by sonically attenuating enclosure means, said equipment including ultrasonic transducers of which one is energized to transmit ultrasonic energy and another is arranged to develop an electric signal as a function of the intensity of received ultrasonic energy, one of said ultrasonic transducers being disposed within said space and the other of said ultrasonic transducers outside said space, whereby ultrasonic energy transmitted between said transducers is attenuated in passing through said enclosure means, and signal processing means responsive to predetermined increase in said electric signal to yield an output signal as a function of a breach in the integrity of said space; the improvement wherein said signal processing means includes:

(a) variable gain amplifier means coupled with said receiving transducer for amplifying said electric signal, thereby to produce an amplified signal;

(b) a threshold device coupled with said variable gain amplifier means for producing from said amplified signal said output signal in response to a received signal in excess of a predetermined amplitide; and

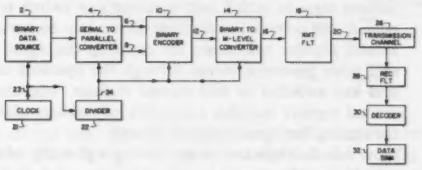
(c) air sensor means responsive to a physical characteristic of the ambient air for producing a gain-control signal, and means coupling said gain control signal with said amplifier means to control the gain thereof, thereby to compensate for variations in sonic transmission resulting from changes in said air characteristic.

4,086,587

APPARATUS AND METHOD FOR GENERATING A HIGH-ACCURACY 7-LEVEL CORRELATIVE SIGNAL

Adam Lender, Palo Alto, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Feb. 28, 1977, Ser. No. 772,797
Int. Cl.[2] H04L *3/00*
U.S. Cl. 340—347 DD **10 Claims**



1. Apparatus for generating a 7-level correlative signal from a serial binary input signal comprising:

means for changing said serial binary signal into two parallel binary bit streams, each at one-half the bit rate of the serial binary signal;

means for encoding the two parallel binary bit streams to obtain correlation between a present digit and the second digit back from said present digit;

means for digitally converting the encoded signal into a 7-level digital signal; and

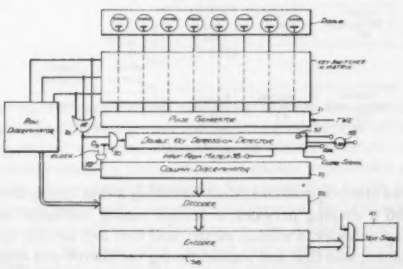
means for transforming said 7-level digital signal into a band-limited correlative 7-level analog signal related on a one-to-one basis to the binary input signal.

4,086,588

SIGNAL GENERATOR

Tsuyoshi Kawanabe, Yokohama, and Minoru Machida, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 365,212, May 30, 1973. This application May 12, 1975, Ser. No. 576,269
Claims priority, application Japan, Jun. 2, 1972, 47-54948; Jun. 22, 1972, 47-73907
Int. Cl.[2] G06F *3/02*; G08C *25/00*
U.S. Cl. 340—365 S **16 Claims**



9. A data input device comprising:

(a) a plurality of key switches arranged in a matrix configuration, said matrix being provided with at least one row line and a plurality of column lines, wherein said switches

are connected respectively at each of the intersections between one row line and one column line;

(b) pulse generator means for distributing pulse signals to each of said column lines in succession during a predetermined time interval, said pulse generator means including a first register consisting of a plurality of memory elements each having an output connected to a respective one of said column lines, and means for differentiating the condition of at least one of said memory elements from the condition of the remaining memory elements;

(c) means for supplying information signals to be displayed, and a display unit having a plurality of display elements connected to said outputs of said pulse generator means wherein said pulses energize said elements to provide display representations in response to the information signals applied thereto;

(d) column line discriminator means operable in response to actuation of one of said key switches for identifying the column lines to which said actuated key switch is connected, said column line discriminator means comprising a second register and means for coupling the signal from said pulse generator means through the operated one of said key switches to said second register, wherein said second register includes a plurality of memory elements for storing the signal coupled thereto;

(e) row line discriminator means having a plurality of memory elements for identifying a row line on which the signal is developed when any one of said key switches coupled to said row line is depressed; and

(f) means for decoding outputs from said row and column line discriminator means to identify which one of said key switches is depressed in accordance with the combination of output signals from said second register of said column line discriminator means and output signals from said memory elements of said row line discriminator means.

4,086,589

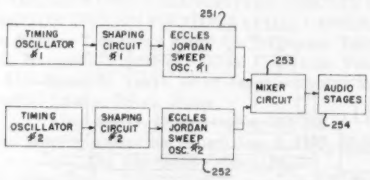
AUDIBLE ELECTRONIC WARNING SYSTEM

Richard F. Cieslak, Algonquin, and John V. Balding, Palatine, both of Ill., assignors to Industrial Electronics Service Co., Schaumburg, Ill.

Division of Ser. No. 664,434, Mar. 8, 1976, Pat. No. 4,075,625, which is a continuation-in-part of Ser. No. 550,219, Feb. 18, 1975, Pat. No. 3,981,007, which is a continuation-in-part of Ser. No. 377,644, Jul. 9, 1973, Pat. No. 3,889,256. This application Mar. 10, 1977, Ser. No. 776,184

Int. Cl.[2] H04Q *3/10*

U.S. Cl. 340—384 E **8 Claims**



1. An electronic siren system including a first timing oscillator and a shaping network, a second timing oscillator and a shaping network, a mixing means, and first and second sweep oscillators, said first and second timing oscillators and shaping networks directing their respective outputs to the respective first and second sweep oscillators, and said sweep oscillators directing their outputs to said mixing means, said mixing means combining the audio outputs from the respective sweep oscillators and delivering the combined output to an audio stage.

4,086,590

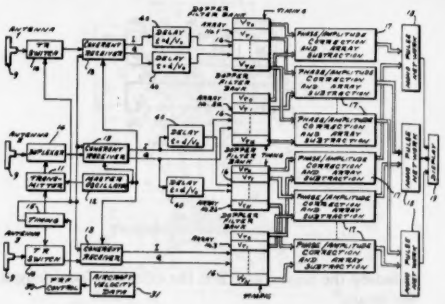
METHOD AND APPARATUS FOR IMPROVING THE SLOWLY MOVING TARGET DETECTION CAPABILITY OF AN AMTI SYNTHETIC APERTURE RADAR

William B. Goggins, Jr., Locke Mills, Me., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 563,009, Mar. 27, 1975, abandoned. This application Jan. 21, 1977, Ser. No. 761,507

Int. Cl.[2] G01S *9/02*

U.S. Cl. 343—5 CM **7 Claims**



1. The method of detecting slowly moving targers with a pulsed AMTI synthetic aperture radar system having multiple receiving antenna elements comprising the steps of

positioning said receiving antenna elements at equal separation distance d along the flight velocity vector V_o of the AMTI radar bearing aircraft,

controlling the PRF of said radar to maintain an interpulse period T of d/V_o, and

differencing the outputs of the synthetic aperture processing circuits of adjacent pairs of receiving antenna elements.

4,086,591

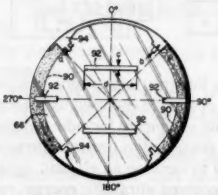
SMALL APERTURE ANTENNA

Kazimierz Siwiak, Waltham, Mass., and Robert L. Moran, Rand, Colo., assignors to Raytheon Company, Lexington, Mass.

Filed Sep. 28, 1976, Ser. No. 728,109

Int. Cl.[2] H01Q *1/42, 17/00*

U.S. Cl. 343—18 A **6 Claims**



1. A device for reducing the backlobe radiation from a small aperture antenna wherein such radiation is caused by radio frequency currents excited on the edge of said antenna, such device comprising:

(a) a radome attached to the edge of the antenna and completely enclosing the radiating end of said antenna;

(b) means, mounted to the radome, for absorbing a portion of the radio frequency currents;

(c) means, disposed on the surface of the radome, for suppressing a portion of the energy radiated from the edge of the antenna; and,

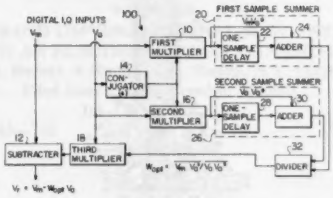
(d) means, mounted to said radome, for reflecting a portion

of the radio frequency energy radiated from the antenna back to the edge of said antenna.

4,086,592
DIGITAL SIDELOBE CANCELLER

Bernard L. Lewis, Oxon Hill, and Frank F. Kretschmer, Jr., Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 22, 1977, Ser. No. 818,180
Int. Cl.[2] G01S 9/42; H04B 1/12
U.S. Cl. 343—100 LE **6 Claims**



1. A digital open-loop canceller receiving a digital complex main input and a digital complex auxiliary input which may have correlated signal components comprising:

conjugator means for receiving and conjugating a said digital complex auxiliary signal;

first multiplier means for receiving and multiplying said digital complex main input and the output of said conjugator;

second multiplier means for receiving and multiplying said digital complex auxiliary input and the output of said conjugator;

first sample summer means for receiving and summing N sample outputs of said first multiplier means, where N is an integer greater than one;

second sample summer means for receiving and summing N sample outputs of said second multiplier means where N is an integer greater than one;

divider means for receiving and dividing the outputs of said first and second sample summer means to produce an output which is a weight;

third multiplier means for receiving and multiplying said digital auxiliary signal and the output of said divider means; and

subtracter means for receiving and subtracting said digital complex main signal and said third multiplier output to produce an output signal in which said correlated signal components have been cancelled.

4,086,593
AM REMOVAL AND PHASELOCK RECEIVER

Richard D. Chelikowsky, Cedar Rapids, and Kenneth R. Stinson, Hiawatha, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 9, 1976, Ser. No. 675,372
Int. Cl.[2] G01S 1/44
U.S. Cl. 343—106 R **3 Claims**

1. A phaselock VOR receiver including:

(a) one or more frequency converter means each producing an intermediate frequency (IF) signal,

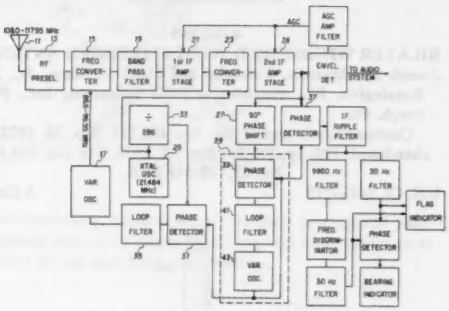
(b) receiving one said IF signal, IF bandpass filter means whose center corresponds nominally to the impressed IF,

(c) means for providing, subsequent to said IF filtering, synchronous amplitude demodulation of one of said IF signals,

(d) means for removing, subsequent to said IF filtering, amplitude modulation (AM) from one of said IF signals, said AM removal means comprising (i) a first phase detector means receiving IF signal at one input, (ii) a first loop filter means for low-pass filtering said first phase detector means output signal, (iii) a first variable oscillator means, controllable by said first loop filter means output signal, for supplying a variable frequency signal to a second input of said first phase detector means,

(e) means for supplying a fixed frequency signal,

(f) second phase detector means receiving at separate inputs, said fixed frequency signal, and said signal from said first variable oscillator means,



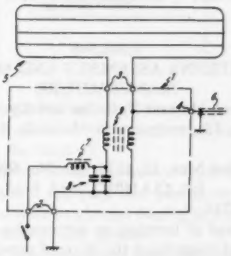
(g) second loop filter means for low-pass filtering said second phase detector means output signal, and

(h) second variable oscillator means, controllable by said second phase detector means output signal, for supplying a variable frequency signal to a frequency converter means preceding said IF filter means.

4,086,594
ELECTRICAL SIGNAL SEPARATING DEVICE FOR COMBINED WINDSHIELD ANTENNA AND HEATER GRID

Barbara Ewa Kropielnicki, and Jerzy Jacek Kropielnicki, both of Knutsford, England, assignors to B.S.H. Electronics (Manchester) Limited, Manchester, England

Filed Sep. 13, 1976, Ser. No. 722,625
Claims priority, application United Kingdom, Nov. 21, 1975, 47902/75
Int. Cl.[2] H01Q 1/02
U.S. Cl. 343—704 **13 Claims**



1. An electrical signal separating device for separating a radio signal from the resistance heating element of an electrically heated window, comprising: an electrical circuit having input terminals for connection to a motor vehicle d.c. power supply, power output terminals for connection to the heating elements, and a radio signal output terminal for connection to the aerial circuit of a radio receiver for feeding radio signals picked up by the heating element to the receiver; said circuit further including a blocking circuit for blocking passage of said radio signals to the power supply, wherein the blocking circuit comprises a bifilar coil formed by two wires wound on a common core and defining two concentric coils, the coils being interposed respectively between the said input terminals and

power output terminals and being mutually coupled and arranged so as to provide high impedance paths for in-phase fluctuating currents at said power output terminals but low resistance paths for currents flowing through said circuit from the d.c. power supply, said resistance heating element acting as a conductive sheet to radio signals, whereby the bifilar coil effectively blocks the radio frequency signals, while passing the current from the d.c. power supply to the heating element.

4,086,595

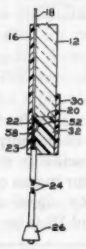
BILAYER WINDSHIELD WITH EMBEDDED ANTENNA

Joseph P. Cherenko, Valencia, and Hugh E. Shaw, Jr., New Kensington, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 400,765, Sep. 26, 1973, abandoned. This application Sep. 30, 1974, Ser. No. 510,830

Int. Cl.[2] H01Q *1/28*

U.S. Cl. 343—713 **4 Claims**



1. A transparent antenna windshield comprising one sheet of glass, a preformed sheet of thermoplastic polyurethane laminated to the inner surface of said glass sheet, and an antenna consisting essentially of elongated electroconductive wire embedded in said polyurethane sheet and adapted for coupling to a radio for use as an antenna circuit element, wherein said windshield is a bilayer windshield having a single sheet of glass disposed outward of said preformed sheet of thermoplastic polyurethane, and said embedded electroconductive element is located within the thickness of said preformed sheet in closer relation to said inner surface of said one sheet of glass than said other major surface of said preformed sheet.

4,086,596

WHIP ANTENNA ASSEMBLY AND METHOD OF MANUFACTURE

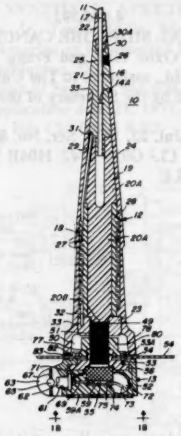
Robert C. Gauss; Hemant T. Sathe, and Lynn D. Wills, all of Schaumburg, Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 22, 1976, Ser. No. 669,001

Int. Cl.[2] H01Q *1/32, 9/18*

U.S. Cl. 343—715 **4 Claims**

1. The method of forming an antenna for a predetermined frequency band comprising the steps of providing an accurate whip member of predetermined length, providing a loading coil having a predetermined number of turns, a predetermined diameter of turns, and a predetermined diameter of wire, interiorly molding said turns against the interior screw surface of a mold whose threads have the same diameters, pitch and groove diameter as the corresponding dimensions of said coil and forming for the length of said coil a hollow molded cylinder whose interior diameter is less than the interior diameter of said turns, providing an electrically insulating supporting member interiorly of said hollow molded cylinder and said coil and exteriorly thereof at one end, providing an interconnecting metal member between one end of said whip member and said electrically insulating supporting member exteriorly of said coil, overmolding the assembly of said loading coil, the hollow molded cylinder, the electrically insulating supporting member exteriorly of said coil and the adjacent portion of said interconnecting metal member and attaching said whip member to said metal member.



4,086,597

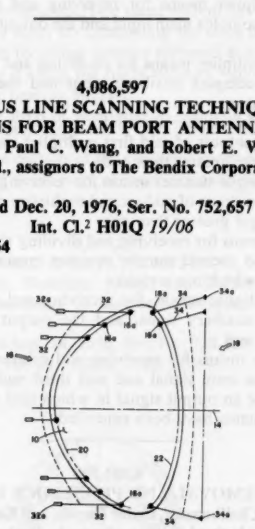
CONTINUOUS LINE SCANNING TECHNIQUE AND MEANS FOR BEAM PORT ANTENNAS

Allen I. Sinsky; Paul C. Wang, and Robert E. Willey, all of Baltimore, Md., assignors to The Bendix Corporation, Southfield, Mich.

Filed Dec. 20, 1976, Ser. No. 752,657

Int. Cl.[2] H01Q *19/06*

U.S. Cl. 343—754 **4 Claims**



1. A radar antenna system including radiating means for scanning radiated energy comprising a parallel plate wave conducting lens having a plurality of individually excitable input means located along the focal arc of said lens for supplying energy to said lens and wherein a plurality of contiguous input means is to be excited simultaneously and a plurality of output means for extracting energy, said output means being connected to said radiating means, and wherein exciting the J^{th} of said input means results in a first radiated beam at an angle of θ_k and exciting the $k + 1^{st}$ of said input means results in a radiated beam at an angle of θ_{k+1}, means for scanning said beam in I steps between θ_k and θ_{k+1} comprising means for exciting a plurality of contiguous output means and weighting the exciting power in accordance with weights W_{ki}, where:

$$W_{ki} = \frac{\cos [Z_i + (k-1)\pi]}{\left[1 - \left\{\frac{2[Z_i + (k-1)\pi]}{\pi}\right\}^2\right]}$$

where: $Z_i = -\frac{K\pi}{2} + i\frac{\pi}{I}$

and

$i = 0, 1, 2, \ldots$ (I-l)

$k = 1, 2 \ldots K$, K being the maximum number of input means to be excited simultaneously.

4,086,598

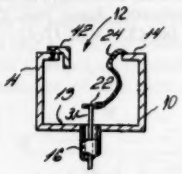
BROADBAND OMNIDIRECTIONAL SLOT ANTENNA WITH AN ELECTRICAL STRAP CONNECTOR

Richard D. Bogner, 4 Hunters La., Roslyn, N.Y. 11576

Filed Dec. 2, 1976, Ser. No. 746,857

Int. Cl.[2] H01Q *3/26*

U.S. Cl. 343—768 **7 Claims**



1. A broadband omnidirectional slot antenna consisting of an electrically conductive tube at least λ long, extending along a major axis, having a girth in the range λ/2 to λ and a slot of a length approximately λ/2 to λ and a width in the range λ/16 to 3 λ/16 extending through the tube wall parallel to the major axis; a two conductor transmission line for coupling energy from a signal source to the said slot antenna, one of said conductors connected to the inner wall of the said tube opposite the said slot; a conductive strap having one end thereof connected to one edge of the slot with λ/8 of the middle of the slot along the tube axis and the other end thereof connected to the other of said conductors, said strap having a dimension along the major axis, for most of the length of the strap, in the range greater than λ/16, and less than λ/4, and of length at least 1¼ times the direct distance between the said connection point to the transmission line and the said slot edge.

4,086,599

DISH ANTENNA WITH ADJUSTABLE AND COLLAPSIBLE SUPPORT

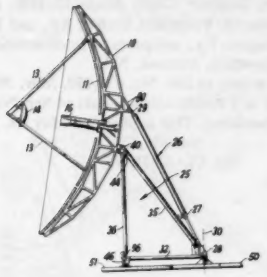
Paul Guisbert VanderLinden, Jr., and James Elwyn Crutcher, both of Kilgore, Tex., assignors to Radio Mechanical Structures, Inc., Kilgore, Tex.

Filed Apr. 19, 1976, Ser. No. 678,048

Int. Cl.[2] H01Q *1/08*

U.S. Cl. 343—881 **2 Claims**

1. In combination in an antenna, a reflector having first and second horizontally spaced junction means at its rear surface defining an antenna elevation axis therebetween and elevation implementing pivot means vertically spaced from said elevation axis, fixed azimuth axis defining bearing and junction means, first and second translating junction means, multi-element rigid truss means interconnecting said first and second horizontally spaced junction means, said first and second translating junction means and said azimuth axis defining bearing and junction means, and means connecting said azimuth bearing and junction means with said elevation axis implementing pivot means, further comprising foundation means having said first azimuth axis defining bearing and junction means affixed thereto and which is in relative translation contact with said first and second translating junction means, said first and second translating junction means having a fixed radius with respect to said bearing and junction means, a plurality of spaced attaching point means affixed to said foundation means at a radius different than the radius between said first and



second translating junction means and said bearing and junction means, and cable means attaching said truss means to at least two of said attaching point means.

4,086,600

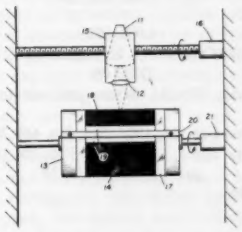
METHOD FOR PRODUCING HALF-TONE, VARIABLE-DENSITY SEISMIC TRACE RECORDINGS

Carroll D. McClure, and John D. Hodge, Jr., both of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 15, 1976, Ser. No. 705,724

Int. Cl.[2] G01D *9/28*

U.S. Cl. 346—1 **4 Claims**



1. A method of producing a seismic color section having selected parameters of the seismic traces recorded in different colors, comprising the steps of:

(a) selecting a first seismic parameter from the recorded seismic signals and applying said parameter sequentially by trace to a variable-brightness display to intensity modulate the brightness of said display,

(b) screening the light emanating from said display,

(c) recording said screened light whereby the images of said first seismic parameter are broken into a plurality of dots so as to produce a first half-tone, variable-density recording,

(d) repeating steps (a)-(c) for each of a plurality of selected parameters of said seismic signals to produce a plurality of half-tone, variable-density recordings,

(e) producing a different color photographic recording from each of said plurality of half-tone, variable-density recordings, the hue of each color being proportional to the value of the selected seismic parameter, and

(f) producing a color composite of said plurality of different color photographic recordings, whereby each selected parameter is uniquely represented by a different color.

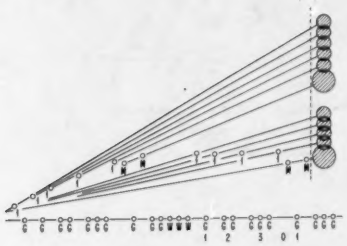
4,086,601
SEQUENTIAL INK JET PRINTING SYSTEM WITH VARIABLE NUMBER OF GUARD DROPS

Gary L. Fillmore, Boulder, Colo.; James D. Hill, Lexington; William F. Robinson, Versailles, both of Ky., and Thomas H. Williams, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 671,780, Mar. 30, 1976, abandoned, which is a continuation-in-part of Ser. No. 587,464, Jun. 19, 1975, abandoned. This application May 24, 1976, Ser. No. 686,421

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **11 Claims**



1. Ink jet printing apparatus having means for generating and directing ink drops toward a record medium for printing on a selective basis, comprising:

means for grouping said drops in drop printing sequences to form characters on said record medium; and

drop control means for producing in each drop printing sequence a sequence of print drops and guard drops wherein a variable number of guard drops is interposed between successive pairs of print drops.

4,086,602
PRINTING VIDEO SIGNAL INFORMATION USING INK DROPS

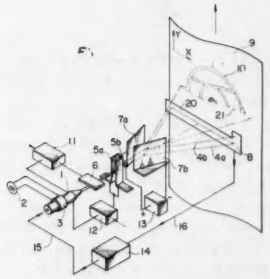
Takahiro Yamada, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 24, 1976, Ser. No. 660,783

Claims priority, application Japan, Feb. 26, 1975, 50-22817

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **6 Claims**



1. In an apparatus for printing video signal information using ink drops, wherein ink under pressure is supplied to a nozzle which is vibrated by a transducer driven from a high-frequency power source to produce a stream of ink which separates into individual ink drops directed toward a recording medium, the improvement comprising means responsive to a video signal for applying a charge of selected magnitude and polarity to the ink drops as they are formed from said stream, first deflecting means responsive to a control signal for selectively deflecting said ink stream before separation in a first axial direction, second deflecting means for deflecting said ink drops in a second axial direction transverse to said first axial direction, and waste catcher means disposed in the path of any ink drop not subject to deflection by said first deflecting means for intercepting such ink drops, wherein said waste catcher means extends over a full deflection width in said second axial direction in order to capture all ink drops which are not deflected in said first axial direction, said waste catcher means further including a portion extending a predetermined distance in said first axial direction in order to intercept any ink drops which are deflected in said first axial direction but are unnecessary to recording.

4,086,603
ELECTRICAL DRIVING CIRCUIT OF CAMERA

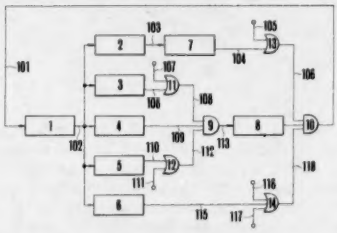
Susumu Kozuki; Takashi Uchiyama; Tadashi Ito, all of Yokohama; Tomonori Iwashita, Fuchu; Masanori Uchidoi, Yokohama, and Yukio Mashimo, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,323

Claims priority, application Japan, Nov. 27, 1974, 49-136845

Int. Cl.² G03B *17/42*

U.S. Cl. 354—204 **14 Claims**



1. An electrical driving circuit for repeating a shutter release operation of a camera operated with an electric flash device and at least a shutter charge operation by a film winding up means comprising:

a. a release period control means for producing a first signal for controlling said shutter release with a certain determined period, said means also controlling the shutter release with the determined period by means of the first signal;

b. a film winding up signal producing means for detecting the operational state of the above mentioned film winding means, said signal producing means producing a second signal when the film winding up means reaches a certain determined operational state;

c. a ready signal producing means for producing a third signal when the electric flash device is ready for operation; and

d. a shutter release control means for detecting said first, second and third signals so as to prohibit the shutter release by means of the first and second signals when the third signal has not been produced before the first and second signals are produced.

4,086,604
SELECTIVE CLOSURE OF CAMERA VIEWFINDER AND CAMERA INCORPORATING SAME

Lawrence M. Douglas, South Easton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 2, 1976, Ser. No. 720,047

Int. Cl.² G03B *13/02*

U.S. Cl. 354—219 **10 Claims**

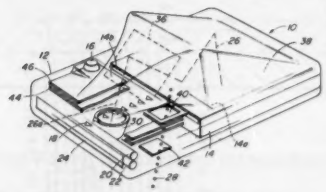
1. A photographic camera employing separate film units and having a viewfinder apparatus and a means for advancing a photosensitive film unit along a given film path which crosses

the optical viewfinder path, said viewfinder apparatus comprising:

means for defining said viewfinder path;

a viewfinder capping member;

means for mounting said capping member for movement between a first position wherein said capping member is in unblocking relation to said viewfinder path to permit



scene viewing and a second position wherein said capping member blocks said viewfinder path from passing light to an advancing film unit;

actuatable means for transferring said capping member between its said first and second positions; and

means for retaining said capping member in its said second position irrespective of operation of said transferring means.

4,086,605

DIAPHRAGM DEVICE

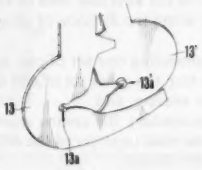
Kazuo Ishikawa; Keiichi Sakaguchi, both of Yokohama; Tomoshi Takigawa, Machida; Noritsugu Hirata, Yokohama; Akira Tajima, Kawasaki, and Sadahiko Tsuji, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 16, 1976, Ser. No. 696,548

Claims priority, application Japan, Jun. 20, 1975, 50-76129

Int. Cl.[2] G03B *17/38*

U.S. Cl. 354—270 **12 Claims**



1. A diaphragm device to regulate the amount of light passing therethrough, comprising:

at least two light intercepting blades which respectively have openings to allow light to pass therethrough and define one diaphragm aperture to regulate an amount of light passing therethrough by having each of said openings mutually cooperate, said blades being arranged in an overlapping relationship to each other with a certain space therebetween to avoid contact with each other and operating to vary a diaphragm aperture to regulate the amount of light passing therethrough by being relatively shifted while maintaining said space therebetween, at least one of said blades having an opening part formed in a manner protruding to a side facing to the other of said blades for defining said diaphragm aperture with a small diameter at a position closer to the other of said blades, said opening part being formed in correspondence to a particular portion of the opening of said at least one blade to define a diaphragm aperture with a small diameter.

4,086,606

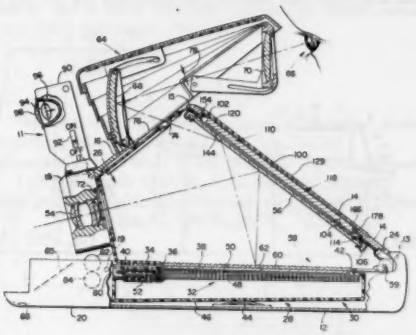
STROBE CAMERA WITH FLAT CAPACITOR

Patrick L. Finelli, Sudbury, and Richard Paglia, Carlisle, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 19, 1976, Ser. No. 733,768

Int. Cl.[2] G03B *17/02*

U.S. Cl. 354—288 **21 Claims**



1. A photographic camera adapted for use with an electronic flash tube and comprising:

a substantially thin flat capacitor for selectively energizing the flash tube;

a substantially planar housing section having an opening therein of sufficient dimension to accommodate therewithin a major surface of said capacitor to facilitate the removable insertion of said capacitor through said opening;

a substantially planar wall section for selectively closing said opening when said capacitor is disposed inwardly of said opening with one of its major external surfaces disposed in immediate coplanar adjacency to said wall section; and

means disposed in immediate coplanar adjacency to the other major external wall surface of said capacitor for cooperating with said planar wall section to restrain any widthwise expansion of said capacitor tending to occur during extended usage of said capacitor without initially imposing any compressive forces on said capacitor tending to alter the electrical characteristics of said capacitor wherein said capacitor is of a generally thin flat rectangular configuration and said wall section has a flat planar, generally rectangular, underlying major surface from which depend two spaced apart substantially parallel tracks disposed on the underside of said major surface of said wall section, said tracks respectively accommodating sliding receipt with two opposed parallel edges of said capacitor so as to retain said one major external surface of said capacitor in immediate coplanar adjacency to said rectangular major surface of said wall section.

4,086,607

X-RAY FILM PROCESSOR

Mathias Müller, Bietigheim, Germany, assignor to Durr - Dental KG., Germany

Filed Dec. 19, 1974, Ser. No. 534,686

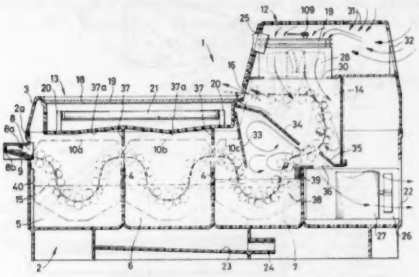
Claims priority, application Germany, Dec. 20, 1973, 7345185[U]

Int. Cl.[2] G03D *13/00*; **F26B** *13/00*

U.S. Cl. 354—299 **14 Claims**

1. An X-ray film processor, comprising a plurality of processing stations for the wet development of X-ray films, said processing stations being arranged within a casing and being followed by a drying station for drying the processed films and transport means for transporting said films through said processing stations and said drying station from a film loading point to a film discharge point, said casing having a bottom,

sides, ends and a top, with the individual processing stations in said casing, to wit a developing station, a fixing station and a rinsing station separated within said casing by partitions which with said bottom, sides and ends define tanks for developing, fixing and rinsing liquids respectively, said partitions extending up above the liquid level in said tanks, said transport means transporting said film up over said partitions in transporting said film from one tank to the next, said top of said casing



having separators extending down from the top above said partitions, the lower edges of said separators being spaced from the upper edges of the respective partitions, and inclined dripping surfaces on the underside of said top of said casing, said dripping surfaces being inclined downwardly from said separators, said separators and inclined dripping surfaces being formed in such a manner as to cause any condensate precipatated onto said underside of said top of said casing to be returned to the tank of the respective processing station.

4,086,608

LIGHT EMITTING DIODE

Arthur R. Clawson, and Herman H. Wieder, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 28, 1975, Ser. No. 636,233
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 **1 Claim**

1. A light emitting diode capable of emitting light in the infrared portion of the spectrum and at room temperature comprising:

(a) an N doped InP substrate,

(b) an N doped epitaxial layer of $InAs_xP_{1-x}$ deposed on said substrate, said N doped epitaxial layer having a first surface in contact with said substrate and a second surface opposite said first surface with x ranging in value from 0.04 at said first surface to 0.05 at said second surface and said substrate and said N doped layer having lattice constants with a mismatch of less than 0.7%,

(c) a P doped epitaxial layer of $InAs_xP_{1-x}$ deposed on said N doped layer with x having a value of 0.05 said N doped layer and said P doped layer having substantially identical lattice constants, and

(d) a conductive ohmic contact material on the surface of said P doped layer,

(e) a conductive ohmic contact material on the exterior surface of said substrate,

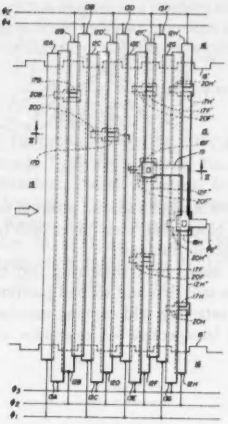
(f) whereby at room temperature and with a voltage applied across said ohmic contacts that ranges from 0.9 to 1.1 volts, said diode will emit light in the range from 0.92 to 1.1μm.

4,086,609

DOUBLE SPLIT-ELECTRODE FOR CHARGE TRANSFER DEVICE

Thomas George Foxall, Carp; Abd-El-Fattah Ali Ibrahim, and Lester Porter Sellars, both of Ottawa, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 20, 1976, Ser. No. 752,116
Int. Cl.[2] H01L *29/78; G11C 19/28;* H03H *7/28*
U.S. Cl. 357—24 **5 Claims**



1. In a charge transfer device for transversal filters and the like, comprising:

a storage body;

a dielectric layer disposed over the body;

an input for mobile charges into the body;

a plurality of interleaved storage electrodes and transfer gates, disposed over the dielectric layer for controlling the sequential transfer of mobile charges from the input along a channel in said body in response to clock voltages applied thereto;

the improvement comprising:

at least some of the alternate ones of said storage electrodes being split along the direcion of charge transfer into three segments;

means for connecting one set of end segments together and for connecting the other set of end segments together for differential sensing; and

means for connecting the centre segments for non-sensing whereby the total capacity of the differentially sensed end segments is reduced.

4,086,610

HIGH RELIABILITY EPI-BASE RADIATION HARDENED POWER TRANSISTOR

Lowell E. Clark, and Jack L. Saltich, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Illinois

Filed Jun. 28, 1974, Ser. No. 484,025
Int. Cl.[2] H01L *29/72*
U.S. Cl. 357—34 **3 Claims**

1. A high-voltage silicon transistor for use in radiation environments exceeding 3×10^{14} cm^{-2} fast neutron fluence, comprising:

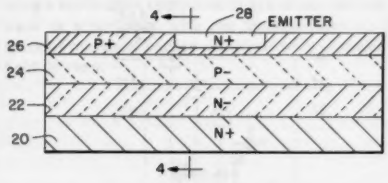
a heavily doped substrate of a first conductivity type having an upper surface,

a collector region of said first conductivity type disposed on said substrate,

a first base region opposite said first conductivity type over said collector region having a net doping density less than the doping density in said collector region and having a thickness exceeding 2 microns,

a second base region of opposite said first conductivity type

over said first base region and having a net doping density greater and a thickness less than those of said first base region so that the total doping of both bases is between 2



$\times 10^{12}$ and 2×10^{13} impurity atoms per square centimeter, and,

an emitter formed over said second base region.

4,086,611

STATIC INDUCTION TYPE THYRISTOR

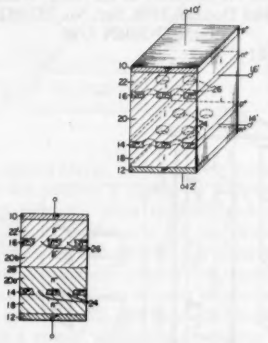
Jun-ichi Nishizawa; Kentaro Nakamura, both of Sendai, and Takashi Kitsuregawa, Nishinomiya, all of Japan, assignors to Semiconductor Research Foundation and Mitsubishi Denki Kabushiki Kaisha, both of, Japan

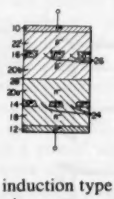
Filed Oct. 19, 1976, Ser. No. 733,930

Claims priority, application Japan, Oct. 20, 1975, 50-126111; Oct. 20, 1975, 50-126113

Int. Cl.[2] H01L *29/74*

U.S. Cl. 357—38 **17 Claims**





1. A static induction type thyristor comprising : a first semiconductor region composed of a selected one of an intrinsic semiconductive material and a semiconductive material of a predetermined conductivity having a low impurity concentration, a second semiconductor region of a predetermined type conducticity disposed adjacent to said first semiconductor region, a third semiconductor region defining a gate region having a conductivity type opposite that of said first semiconductor region and disposed within said first semiconductor region so that those portions of said first semiconductor region located on both sides of said third semiconductor region are continuous to each other through limited portions thereof passing through said third semiconductor region, said first and said third semiconductor regions having relative impurity atom concentrations effective to form charge depletion regions when no electrical signal is applied to said third semiconductor region and which prevents injection of charge carriers through said limited portions of said first semiconductor region passing through said third semiconductor region wherein the thyristor is in a blocking state, and said first and said third semiconductor regions having relative impurity atom concentrations such that electrically forward biasing said third semiconductor region effectuates sufficient reduction of said depletion regions that a sufficient quantity of charge carriers may be injected through said limited portions of said first semiconductor region passing through said third semiconductor region that said first semiconductor region exhibits a negative resistance characteristic and the thyristor rapidly switches from the blocking state to a conductive state, a first electrode disposed in ohmic contact with said first semiconductor region, a second electrode disposed in ohmic contact with said second semiconductor region, and a third electrode disposed in ohmic contact with said third semiconductor region.

4,086,612

THYRISTOR

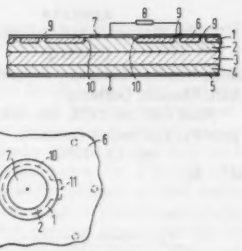
Peter Voss, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 478,809, Jun. 12, 1974, abandoned. This application Mar. 10, 1976, Ser. No. 665,654

Claims priority, application Germany, Jun. 12, 1973, 2329872

Int. Cl.[2] H01L *29/74*

U.S. Cl. 357—38 **3 Claims**



1. A thyristor comprising:

A. a semiconductor body having opposed first and second surfaces and first, second, third and fourth zones of alternating conductivity type extending through the body from the first surface to the second surface with PN junctions formed between adjacent zones, said first and second zones being emitter and base zones, respectively, and having said PN junction therebetween adjoining said first surface;

B. a first emitter electrode affixed to said first surface at said emitter zone;

C. a second electrode affixed to said first surface at said base zone; and

D. at least one shunt extending between said emitter and second electrodes through said semiconductor body at said first surface, each of said at least one shunt consisting of a projection in said base zone extending to adjoining said emitter electrode, and providing an electrically conductive path of a given resistance between said electrodes at said first surface uninterrupted by said PN junction between said emitter and base zones.

4,086,613

SEMICONDUCTOR DEVICE HAVING A PASSIVATED SURFACE AND METHOD OF MANUFACTURING THE DEVICE

Jean-Pierre Henri Biet, Caen, and Sio Dhat Laou, Herouville St-Clair, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 8, 1976, Ser. No. 748,697

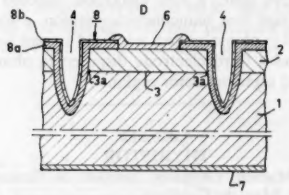
Claims priority, application France, Dec. 19, 1975, 75 39046

Int. Cl.[2] H01L *29/34, 27/12, 29/06, 29/04*

U.S. Cl. 357—54 **12 Claims**

1. A semiconductor device comprising a semiconductor body portion of a first conductivity type having a semiconductor region of the opposite type forming with said body portion a p-n junction which intersects the surface of the body portion,

and a passivating combined layer on said body portion surface and at least at the area of said p-n junction, said combined layer comprising a first semiconductor layer portion said body portion surface and having a resistivity of at least 10^{10} ohm.cm and a second semiconductor layer portion on said first layer portion and having a resistivity of at most 10^{8} ohm.cm.

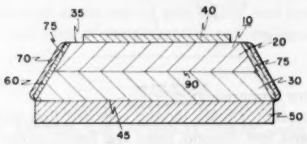


4,086,614

COATING FOR PASSIVATING A SEMICONDUCTOR DEVICE

Fritz Scheidel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Oct. 24, 1975, Ser. No. 625,614
Claims priority, application Germany, Nov. 4, 1974, 2452289
Int. Cl.[2] H01L *29/34*
U.S. Cl. 357—54 **4 Claims**



1. A semiconductor device comprising a body of silicon semiconductor material, said body of silicon semiconductor material comprising major opposed flat parallel surfaces, a peripheral edge surface extending between said major opposed surfaces, at least two zones of opposite conductivity type, a PN junction at the interface between said two zones, said PN junction emerging at said peripheral edge surface; a coating for passivating said peripheral edge surface, said coating comprising an inner layer of SiO_2 of a predetermined thickness containing from about 0% to about 2%, by weight, of Al_2O_3, said inner SiO_2 layer being disposed on said peripheral edge surface and covering said PN junction, an outer layer of SiO_2 of a predetermined thickness containing from about 1% to about 8%, by weight, of Al_2O_3, said outer SiO_2 layer being disposed on said inner SiO_2 layer, said inner SiO_2 layer containing a lesser percentage by weight of Al_2O_3 than said outer SiO_2 layer, whereby said outer SiO_2 layer contains negative charges and said inner SiO_2 layer contains positive charges.

4,086,615

METHOD AND APPARATUS FOR THE GAMMA CORRECTION OF VIDEO SIGNALS

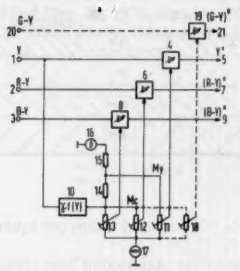
Michael Koubek, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 25, 1976, Ser. No. 670,410
Claims priority, application Germany, Apr. 9, 1975, 2515479
Int. Cl.[2] H04N *9/53*
U.S. Cl. 358—32 **7 Claims**

1. A method for the gamma correction of video signals in which the luminance signal and at least one signal containing an item of color information are multiplicatively corrected in the signal transmission path, comprising the steps of:

generating a luminance control signal as a function of the luminance signal;

generating a color difference control signal as a function of the luminance signal;



amplifying the luminance signal and controlling the amplification with the luminance control signal; and

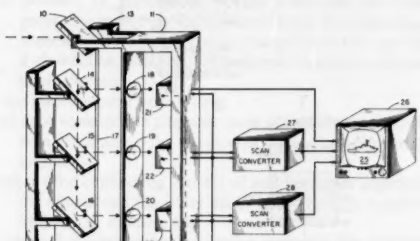
amplifying at least two separate color difference signals and controlling the amplifications thereof as functions of the color difference control signal.

4,086,616

ALL-WEATHER MULTI-SPECTRAL IMAGING SYSTEM

Paul S. Catano, San Diego, and William E. Richards, El Cajon, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 23, 1976, Ser. No. 753,952
Int. Cl.[2] H04N *1/46*
U.S. Cl. 358—81 **6 Claims**



1. An all weather maximum resolution system for visually presenting a multi-color composite image of plural selected spectral ranges of energy received from a common field of view comprising:

optical means controllably directed to receive energy from any desired field of view within 360° rotation in azimuth and substantially 90° in elevation;

first, second, and third means synchronously operative and aligned with said optical meas for simultaneously producing first, second, and third images of said desired field of view;

a first sensor responsive to energy components of sad first image within the visible range for producing a first set of electrical signals commensurate therewith;

a second sensor responsive to energy components of said second image within the middle infrared range for producing a second set of electrical signals commensurate therewith;

a thrid sensor responsive to energy components of said third

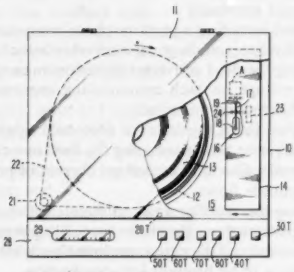
image within the far infrared range for producing a third set of electrical signals commensurate therewith;

a multi-color cathode ray tube for producing images in three different primary colors and connected to receive said first, second, and third sets of electrical signals for generating a multi-color composite image of said desired field of view in accordance with the multiple discrete selected spectral ranges of energy simultaneously detected in said field of view.

4,086,617
VIDEO DISC PLAYER MECHANISM CONTROL SYSTEM

Alfred Lynn Baker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 5, 1977, Ser. No. 756,833
Claims priority, application United Kingdom, Jan. 5, 1976, 00207/76
Int. Cl.² H04N *5/76*; G11B *17/06*
U.S. Cl. 358—128 **22 Claims**



1. In a disc record player, including a rotatable turntable for supporting a disc record; a motor for supplying rotational drive for said turntable when supplied with an energizing alternating current; a stylus arm for supporting at one end thereof a pickup stylus; a housing for said stylus arm; a carriage secured to said housing and subject to a translational movement providing motion of said housing between a rest position remote from said turntable and playback positions over said turntable; and a power supply for developing an operating potential between a pair of output terminals when energized with alternating current; a player control system including, in combination:

a power switch completing a first current path, for supplying an energizing alternating current to said power supply, only when switched to an "on" position;

a play initiating switch subject to manual actuation; and

a rest switch, subject to switching from a first switch position to a second switch position, when actuation of said play initiating switch coincides with housing occupancy of said rest position;

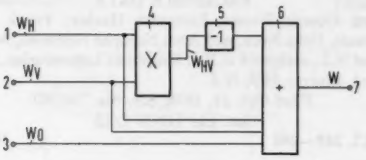
said rest switch, when in said second switch position, (a) completing a second current path for supplying energizing alternating current to said motor, and (b), in cooperation with said power switch, completing a third current path for supplying energizing alternating current to said power supply when said power switch is in an "off" position;

said rest switch responding to a return of said housing to said rest position from positions removed therefrom by switching from said second switch position to said first switch position in which said second and third current paths are disrupted.

4,086,618
PROCESS AND CIRCUIT ARRANGEMENT FOR CONTOUR CORRECTION OF THE LUMINANCE SIGNAL IN A TELEVISION CAMERA

Michael Koubek, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 13, 1976, Ser. No. 676,619
Claims priority, application Germany, Apr. 24, 1975, 2518328
Int. Cl.² H04N *5/14*
U.S. Cl. 358—166 **5 Claims**

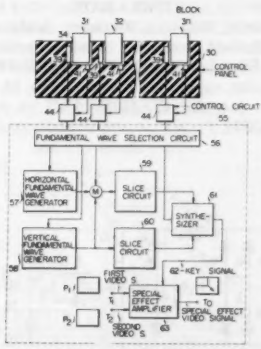


1. A circuit arrangement for contour correction of the luminance signal in a television camera, comprising an adder, means for feeding a relatively poorly defined luminance signal to said adder, means for feeding a horizontal contour signal to said adder for increasing the vertical resolution of the luminance signal, means for feeding a vertical contour signal to said adder for increasing the horizontal resolution of the luminance signal, signal multiplying means for deriving an additional contour signal which is the multiple of said horizontal and vertical contour signals, a signal inverter, means for feeding said additional derived contour signal through said signal inverter to said adder, said adder having an output terminal from which the combined signals may be taken.

4,086,619
SPECIAL IMAGE EFFECT PRODUCING APPARATUS

Kazuhiko Miyake, and Bunkichi Yamada, both of Kawasaki, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Mar. 25, 1977, Ser. No. 781,516
Claims priority, application Japan, Mar. 31, 1976, 51-34410
Int. Cl.² H04N *5/22*; G11C *11/02*
U.S. Cl. 358—183 **7 Claims**



1. A special image effect producing apparatus comprising:

blocks each having a pattern for indicating a kind of special image effects, and at least a first and second discriminating regions, said first region including first information for a first special image effect, said second region including second information for a second special image effect, and both special image effects corresponding to said pattern;

a control panel onto which said blocks are mounted;

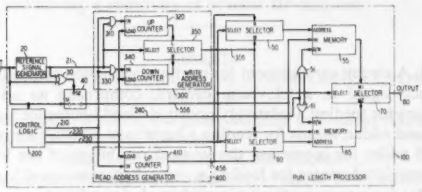
detecting means for detecting a desired discriminating information from said first or second discriminating region and for producing a code signal corresponding to the detected discriminating information; and,

circuit means, upon receipt of said code signal, to produce the special image effect corresponding to said code signal.

4,086,620
PROCESSOR FOR INCREASING THE RUN-LENGTH OF FACSIMILE DATA

Edward George Bowen, Lawrence Harbor; Frank William Mounts, Colts Neck, and Arun Narayan Netravali, Matawan, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 21, 1976, Ser. No. 734,387
Int. Cl.[2] H04N 7/12
U.S. Cl. 358—260 **10 Claims**



1. Apparatus for increasing the run-length of a first digital signal comprising

an input terminal adapted to receive said first signal,

means for providing a measure of said first signal,

means for supplying a reference signal,

means responsive to said reference signal for permuting said signal measure, said permuting means including

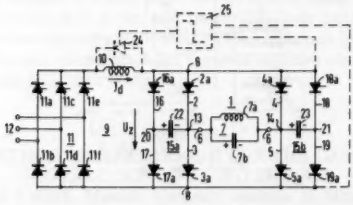
means responsive to a first state of said reference signal for ordering a first element of said signal measure in a first manner, and

means for extending said permuted signal measure to an output terminal.

4,086,621
CYCLOCONVERTER AND METHOD FOR ITS OPERATION

Lovro Vukasovic, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sep. 8, 1976, Ser. No. 721,490
Claims priority, application Germany, Sep. 18, 1975, 2541722
Int. Cl.[2] H02M 5/45
U.S. Cl. 363—37 **1 Claim**



1. A method of operating a cycloconverter, the cycloconverter being adapted for use with a load comprising a parallel resonant circuit and for use with an intermediate DC link supplied by an AC voltage source and including a smoothing choke and a controlled rectifier, the cycloconverter including:

an inverter circuit comprising a bridge circuit having output terminals adapted to be connected to said load and input terminals adapted to be connected to said DC link, said bridge circuit including:

first and second bridge branches having a first common terminal therebetween; each of said first and second bridge branches including a controllable thyristor;

third and fourth bridge branches having a second common terminal therebetween, each said third and fourth bridge branches including a controllable thyristor;

an auxiliary commutating device including:

first and second converter branches having a third common terminal therebetween and connected in parallel with said first and second bridge branches, each said converter branches including a controllable thyristor poled in the same direction as the thyristors of said bridge branches;

third and fourth converter branches having a fourth common terminal therebetween and connected in parallel with said third and fourth bridge branches, each said third and fourth converter, branches including a thyristor poled in the direction of the thyristors of said bridge branches;

and first and second commutation capacitors; said first commutation capacitor being connected to said first and third common main terminals and said second commutation capacitor being connected to said second and fourth common main terminals;

the method including a start-up phase comprising:

firing thyristors of diagonal converter branches and maintaining the fired converter thyristors in conduction until the voltage on each commutating capacitor reaches a predetermined magnitude;

thereafter, firing thyristors of diagonal bridge branches of the inverter and maintaining the fired inverter thyristors in conduction until a constant current of predetermined magnitude flows;

controlling the rectifier so as to maintain the constant current constant throughout the succeeding steps;

firing thyristors of the converter branches which are next in succession to be brought into conduction;

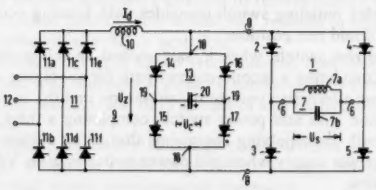
after a predetermined time interval determined by the voltage of predetermined magnitude and said constant current, firing the thyristors of the bridge branches next in succession to be brought into conduction;

and repeating the immediately preceding two steps in succession prior to each said resonantcircuit voltage makes a zero crossing until said resonant circuit voltage reaches a predetermined magnitude.

4,086,622
FREQUENCY CONVERTER AND METHOD OF OPERATING SAME

Lovro Vukasovic, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Sep. 9, 1976, Ser. No. 721,694
Claims priority, application Germany, Sep. 18, 1975, 2541700
Int. Cl.[2] H02M 5/45
U.S. Cl. 363—37 **1 Claim**



1. A method, for operating a frequency converter comprising an inverter having thyristors in a bridge circuit, the output terminals of which are connected to a parallel resonant circuit and the input terminals of which are connected to an a-c volt-

age source through an intermediate d-c link containing a smoothing choke and a controlled rectifier with the input terminals of the inverter bridged by an auxiliary commutating arrangement comprising only a bridge circuit of thyristors the a-c outputs of which are coupled only across a capacitor including, during the start-up phase, firing thyristors of corresponding diagonal bridge arms of the inverter and of the auxiliary commutating device prior to every zero crossing of the resonant circuit voltage and, after the conclusion of the start-up phase, firing only thyristors of diagonal bridge arms of the inverter while the thyristors of the auxiliary commutating arrangement remain unfired, comprising the steps of:

(a) firing the thyristors in two diagonal bridge arms of the auxiliary commutating arrangement at the start of the operation and maintaining said thyristors conducting until the voltage at the capacitor of the auxiliary commutating arrangement has reached a first predetermined magnitude;

(b) firing the thyristors in two diagonal bridge arms of the inverter when said voltage magnitude is reached and maintaining conduction until a current of predetermined magnitude flows;

(c) maintaining said current constant during the entire start-up phase by controlling the rectifier;

(d) after said current magnitude is reached, firing the thyristors of bridge arms of the auxiliary commutating arrangement that conduct next;

(e) after a constant time delay firing the thyristors of bridge arms of the inverter that conduct next, said time delay depending on the voltage and the current of predetermined magnitude;

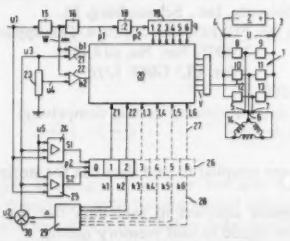
(f) subsequently, prior to every zero crossing of the resonant circuit voltage firing the thyristors of bridge arms of the auxiliary commutating arrangement and, delayed by said constant time delay, firing the corresponding thyristors of the inverter; and

(g) continuing this switching cycle until a resonant circuit voltage of second predetermined magnitude which is sufficient for direct communication is reached.

4,086,623
METHOD AND APPARATUS FOR CONTROLLING AN INVERTED RECTIFIER

Arne Jensen, Sonderborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark

Filed Dec. 1, 1976, Ser. No. 746,491
Claims priority, application Germany, Dec. 3, 1975, 2554259
Int. Cl.² H02M 7/515
U.S. Cl. 363—41 **15 Claims**

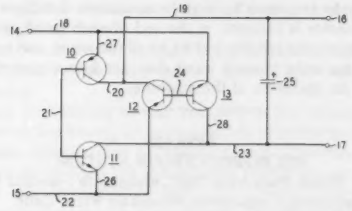


1. A method of controlling an inverted rectifier with constant DC supply voltage and adjustable frequence and amplitude of the fundamental oscillation of the output voltage, comprising the steps of forming at least part of the phase voltage by width-modulated impulses, increasing the voltage-time area of the impulse series to eliminate an inadequate impulse spacing, and partially compensating the increase in the voltage-time area by reducing the widths of at least some of the remaining impulses, said increase in voltage-time area being characterized by a switching-over from modulated to unmodulated operation in at least one first predetermined section and the reduction in impulse widths is carried out in at least one second predetermined section.

4,086,624
CURRENT TO VOLTAGE CONVERTER

Phillip Edward Fraley, Reading, Pa., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Jun. 15, 1977, Ser. No. 806,959
Int. Cl.² H02M 7/00
U.S. Cl. 363—127 **7 Claims**



1. A circuit for converting a current of either polarity at first and second inputs to a fixed voltage of a single polarity across first and second outputs comprising:

a first pair of transistors with a first transistor having its emitter electrically coupled to the first input and its collector electrically coupled to the first output and a second transistor with its collector electrically coupled to the second output and its emitter electrically coupled to the second input, the bases of said first and second transistors being electrically coupled; and

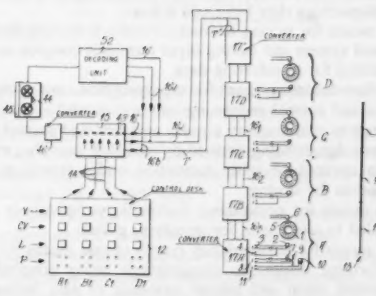
a second pair of transistors with a third transistor having its emitter electrically coupled to the second input and its collector electrically coupled to the first output and a fourth transistor with its emitter electrically coupled to the first input and its collector electrically coupled to the second output, the bases of said fourth and fifth transistors being electrically coupled.

said pairs being coupled so that a different pair is conductive for either of the two polarities of the current at the inputs.

4,086,625
PROCESS FOR REPEATING CONTROL OF WORKING OPERATIONS OF SEVERAL MACHINES

Pierre Georges Garnier; Bruno Gaullier, and Gérard Michel Jeanroy, all of Paris, France, assignors to Auvitec, Paris, France

Filed Jul. 16, 1976, Ser. No. 705,942
Claims priority, application France, Jul. 17, 1975, 75 22441
Int. Cl.² H04C 9/02
U.S. Cl. 364—104 **31 Claims**



1. Apparatus for the control of working operations of a

plurality of machines from binary code commands, the apparatus comprising at least one binary-analog convertor located on every machine, each binary-analog convertor including serially connected input detectors in a number equal to the number in binary code of the functions to be executed by the corresponding machine, cables each comprising at least one conductor to connect together the binary-analog converters of all the machines, so that all the input detectors are serially connected, at least one system for generating and transmitting successive words in binary code which define series successive commands and each of the words containing a number of bit positions corresponding to the number of the input detectors, means to input step by step each bit into the successive detectors so that every detector is brought, at the end of each word, in a state depending on the corresponding bit of the word, and means to convert the state of each input detector into a control command of an operation of the machine.

4,086,626

MICROPROCESSOR SYSTEM

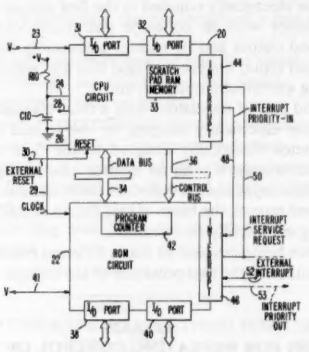
David H. Chung, Palo Alto, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Division of Ser. No. 512,753, Oct. 7, 1974, Pat. No. 3,984,813. This application Jun. 7, 1976, Ser. No. 693,811

The portion of the term of this patent subsequent to Oct. 5, 1993, has been disclaimed.

Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—200 **12 Claims**



1. A microprocessor system comprising a first large scale integration circuit forming a central processing unit, and a second large scale integration circuit forming a memory circuit;

(a) said central processing unit comprising

(1) means for transferring data;

(2) at least one input/output port means coupled to said means for transferring data for entering data into and dispatching data from said system;

(3) means for storing instruction codes to by executed by said system and having input terminals coupled to said means for transferring data;

(4) first decoding means for supplying first control signals to said central processing unit and second control signals to said memory circuit, said first and second control signals being derived by said first decoding means in accordance with instruction codes stored in said means for storing;

(5) means for performing arithmetic computations coupled to said means for transferring data;

(6) means for accumulating results of said means for performing arithmetic computations being coupled between input and output terminals of said means for performing;

(7) random access memory means coupled between input and output terminals of said means for performing arithmetic computations for storing results of said means for performing;

(8) gating means coupling said output terminals of said means for performing arithmetic computations with said means for transferring data;

(9) means for transmitting said instruction codes from said means for storing to one or more of said first decoding means, said means for performing arithmetic computations, and said random access memory means;

(10) means coupling said first control signals from said first decoding means to said input/output port means, said means for storing instruction codes, said means for performing arithmetic computations, said means for accumulating, said random access memory means, said means for transmitting, and said gating means, whereby operation of said central processing unit is controlled by said first control signals in accordance with said instruction codes;

(11) clock circuit means for providing a system clocking signal of a first frequency in response to a first state of one of said first control signals from said first decoding means and a second frequency in response to a second state of said one of said first control signals, whereby the speed of operation of said system is controlled in accordance with the instruction codes; and,

(b) said memory circuit comprising

(1) storage means for storing a multiplicity of the instruction codes for said system;

(2) second decoding means for receiving said second control signals from said first decoding means in said central processing unit and for generating third control signals in accordance with said second control signals to control operation of said memory circuit;

(3) means for addressing said storage means in response to said third control signals and retrieving selected codes from said storage means in response to said second control signals from said first decoding means in said central processing unit; and,

(4) means for transferring said retrieved instruction codes to said means for storing instruction codes.

4,086,627

INTERRUPT SYSTEM FOR MICROPROCESSOR SYSTEM

Thomas H. Bennett; Earl F. Carlow, both of Scottsdale; Edward C. Hepworth, Apache Junction, all of Ariz.; Wilbur L. Mathys, Norristown, Pa.; William D. Mensch, Jr., Norristown, Pa.; Rodney H. Orgill, Norristown, Pa.; Charles I. Peddle, Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 519,149, Oct. 30, 1974. This application Sep. 17, 1975, Ser. No. 614,110

Int. Cl.[2] G06F *9/18*

U.S. Cl. 364—200 **6 Claims**

1. A digital data processing system comprising:

a peripheral device;

a data bus;

memory means coupled to said data bus for storing instructions;

processor means coupled to said data bus for executing instructions stored in said memory means;

adaptor means coupled between said data bus and said peripheral device for transferring data between said data bus and said peripheral device;

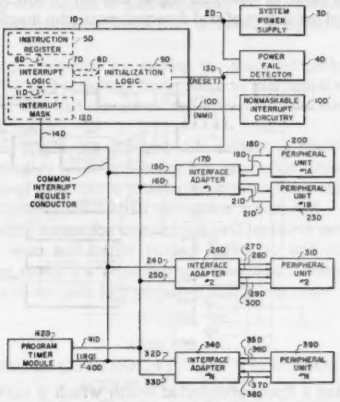
a first interrupt conductor coupled to said peripheral device and to said adaptor means;

a second interrupt conductor coupled to said processor means and to said adaptor means;

said processor means including first interrupt means coupled to said second interrupt conductor for effecting addressing of a certain location in said memory means in response to a first interrupt signal on said second interrupt conductor;

said adaptor means including

(a) second interrupt means coupled to said first interrupt conductor, to said data bus, and to said second interrupt conductor for producing said first interrupt signal in response to a second interrupt signal produced on said first interrupt conductor by said peripheral device; and



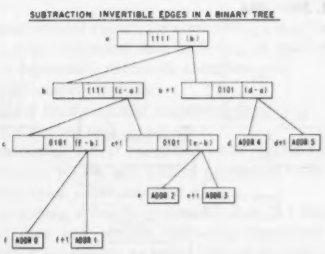
(b) status means responsive to said second interrupt signal coupling said data bus to said second interrupt means for storing information indicative of the occurrence of said second interrupt signal and transferring said information to said processor means via said data bus.

4,086,628

DIRECTORY GENERATION SYSTEM HAVING EFFICIENCY INCREASE WITH SORTED INPUT

Luther Jay Woodrum, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 197,415, Nov. 10, 1971, abandoned.
This application Nov. 12, 1973, Ser. No. 415,090
Int. Cl.[2] G06F *7/22, 7/10*
U.S. Cl. 364—200 **4 Claims**



1. A system using a computer machine for constructing therein a directory entity having stored sub-groups interconnected into a tree structure which may be used to look-up items called object identifiers, the object identifiers being machine-inputted as sets of digitized electrical signals to be represented in, but not included in, said directory entity, said directory entity formed of inner vertex sub-groups and end-of-path sink sub-groups, each inner vertex sub-group including a connector item and an index-position item, the connector addressing a successor-pair sub-group which contains other inner vertex or sink sub-groups, and the index position item in each inner vertex sub-group identifying a particular digit position in an object identifier, said system comprising

means for allocating a storage part of an electrically inscribable storage medium, said storage part being available to receive a pair of sub-groups in said directory entity, said storage part having at least two portions for receiving respective sub-groups,

means for registering in a first register device an address item received from the allocating means for locating said storage part in said machine,

means for comparing a currently inputted object identifier and a last inputted object identifier to identify their highest-order digit position having unequal digits, a new index position item recorded as the value of the highest order digit position,

means for sensing the stored state in the inputted object identifier at the highest order digit position located by said comparing means,

means for tracing a backpath in said directory entity beginning with a sink sub-group last inserted into said directory entity,

means for locating in said backpath a first existing vertex sub-group having an index position item less than the new index position item provided by said comparing means,

means for moving the first existing vertex sub-group found by said locating means into a first portion of the allocated storage part which now contains a displaced inner vertex sub-group,

means for inserting into a second portion of the allocated storage part an address item for locating said object identifier in response to operation by said sensing means, the second portion now containing a new sink sub-group,

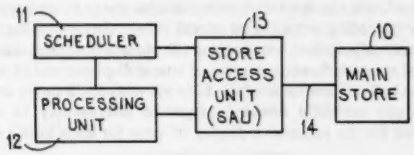
and means for inscribing the new index position item provided by said comparing means and said address item provided by said registering means into the location found for said first existing vertex sub-group by said locating means, said address item being a new connector for the new inner vertex sub-group now contained in the directory entity.

4,086,629

HIERARCHICAL DATA STORE WITH LOOK-AHEAD ACTION

Peter Leo Lawrence Desyllas, Wilmslow Park; John Austin Jones, Stockport, and Brian John Procter, Hyde, all of England, assignors to International Computers Limited, London, England

Filed Jun. 28, 1976, Ser. No. 700,720
Claims priority, application United Kingdom, Jul. 9, 1975, 28800/75
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—200 **5 Claims**



1. A data storage system comprising a main store, a slave store of smaller size but faster access time than the main store, means responsive to a set of store access commands for accessing data items from the slave store, each said store access command having a store access address associated with it, and look-ahead logic comprising:

a. means responsive to one of a sub-set of said store access commands to generate an increment signal,

b. means for adding said increment signal to said store access address to produce a look-ahead address, and

c. means for applying the look-ahead address to the main store to access a data item from the main store for writing into the slave store.

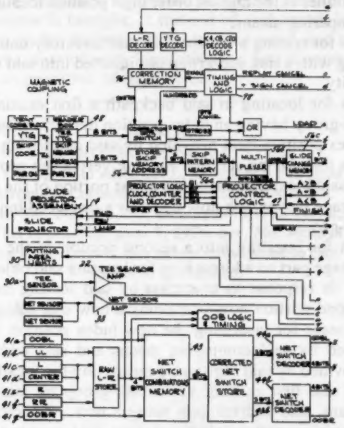
4,086,630
COMPUTER TYPE GOLF GAME HAVING VISIBLE FAIRWAY DISPLAY

Maxmilian Richard Speiser, 245 W. 104th St., New York, N.Y. 10025; Don Eng, 50 Bayard St., New York, N.Y. 10013, and Gerry Dun Sawyer, 509 W. 112th St., New York, N.Y. 10025

Continuation-in-part of Ser. No. 492,751, Jul. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 383,885, Jul. 30, 1973, abandoned. This application Jan. 19, 1976, Ser. No. 650,126

Int. Cl.[2] A63B *67/02, 69/36;* **G06F** *15/20*

U.S. Cl. 364—410 **4 Claims**



1. In a computer-type golf game including sensing means for determining the time of flight of a ball between a tee off point and a point on a screen, and computer means for determining the theoretical flight distance of said ball based upon elapsed time, means for projecting a series of images of a golf course under control of said computer means, and a simulated ball image projector under control of said computer, for casting a ball image in superimposed relation upon said screen, the improvement comprising: means sensing the point of impact of said ball with respect to the central axis of said screen, said projector having image storage means for selectively projecting images corresponding to views facing a pin on a golf green corresponding to predetermined points at varying coordinate distances from said pin, said images being successively selected for projection for a subsequent stroke on the basis of distances attained, and the degree of lateral displacement of an immediately preceding stroke, first signal means for indicating the presence of a stroke overshooting the pin of a hole, and second signal means indicating degrees of lateral displacement of a lay of the ball on either side of the fairway; whereby a single set of generally centrally oriented projected images may be employed for the successive display of view for each hole.

4,086,631
HEMATOCRIT MEASUREMENT IN AN AUTOMATIC HEMATOLOGY ANALYZER

Howard Andrew Vick, Pearland, Tex., assignor to Hycel, Inc., Houston, Tex. and Hycel, Inc., Houston, Tex.

Division of Ser. No. 535,495, Dec. 23, 1974, Pat. No. 4,052,596. This application Dec. 20, 1976, Ser. No. 752,015

Int. Cl.[2] G01N *15/08;* **G06M** *11/04*

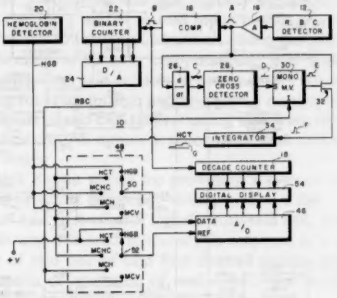
U.S. Cl. 364—416 **5 Claims**

1. In a blood cell analyzer in which a cell signal is provided in response to the detection of blood cells in a precise volume of blood, said cell signal including a plurality of pulses, with each pulse representing the detection of one cell and with the magnitude of each pulse relating to the size of each detected cells, hematocrit measuring means for providing a voltage relating to the hematocrit of the blood comprising:

integration means for summing signals applied thereto;

controlled switching means for coupling said pulses to integration means; and

detecting means for detecting the maximum of magnitude of each pulse of said cell signal and for producing a gate signal indicative of said detected maximum magnitude and



having a fixed, preselected width which is narrow compared to a typical pulse width, said detecting means being coupled to said controlled switching means for rendering said controlled switching means conductive in response to said gate signal, whereby said integrator is incremented by a voltage indicative of a peak portion of each pulse and the voltage stored in said integration means at the completion of said cell signal comprises the voltage relating to the hematocrit of the blood.

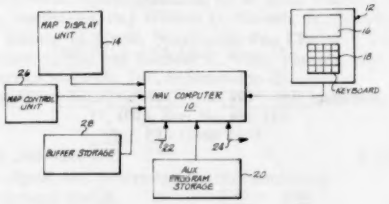
4,086,632
AREA NAVIGATION SYSTEM INCLUDING A MAP DISPLAY UNIT FOR ESTABLISHING AND MODIFYING NAVIGATION ROUTES

Richard O. Lions, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 27, 1976, Ser. No. 726,633

Int. Cl.[2] G06F *15/50*

U.S. Cl. 364—444 **12 Claims**



1. In an area navigation system wherein a desired navigation route including at least one guidance path between selected geographic points is stored within storage means of an area navigation computer, the improvement comprising a map display unit for providing a cartographic display of navigation information relative to said desired navigation route, said map display unit having data entry means for entering navigation information to said area navigation computer, said data entry means including:

cursor means positionable on said cartographic display for selecting a geographic point within the geographic region depicted by said cartographic display;

first and second switch means, said first switch means for supplying a signal representative of the positional coordinates of a geographic location selected with said cursor means when said geographic location is to be eliminated

from a previously established desired navigation route, said second switch means for supplying a signal representative of the positional coordinates of the geographic location selected by said cursor when said geographic location is to be added to a previously established desired navigation route, said first and second switch means supplying said signals to said computer for the calculation of guidance paths between said selected geographic locations;

buffer storage means for storing the guidance paths calculated by said computer in response to said signal supplied by said first and second switch means as a tentative navigation route;

means for displaying said tentative navigation route on said map display unit, said tentative navigation route being displayed as a visible pattern discernible from said previously established desired navigation route; and

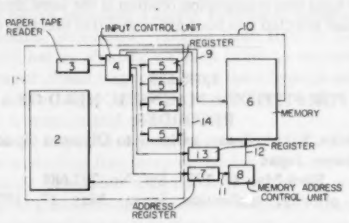
third switch means for transferring said tentative navigation route from said buffer storage means to said computer storage means for replacing said previously desired navigation route with said tentative navigation route.

4,086,633

NUMERICAL CONTROL SYSTEM WITH PROGRAM ACCESS FUNCTION

Hajimu Kishi; Tetsuo Ohkubo, and Noriyuki Koikawa, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1976, Ser. No. 694,933
Claims priority, application Japan, Jun. 24, 1975, 50-76436
Int. Cl.[2] G05B *19/28*
U.S. Cl. 364—474 **3 Claims**



1. A numerical control system for controlling a machine tool in accordance with command data including at least one repeat-data to be repeatedly executed, comprising

a machine tool control section;

input means for receiving said command data;

a memory for storing said repeat-data;

means for decoding a first command code (G25), a second command code (G26), and a third command code (G24) respectively from said command data;

means for decoding a fourth command code (L) from said command data and storing following numerical value thereof which represents an initial address for said repeat-data in said memory;

means for decoding a fifth command code (P) from said command data and storing following numerical value thereof which represents the number of repetition of said repeat-data and which is counted-down at every decoding moments of said second command code (G26);

means for executing storing operation in which said repeat-data applied to said input means is stored in said memory corresponding to said address signal when said first command code (G25) is decoded, and maintaining said storing operation until said second command code (G26) is decoded, and;

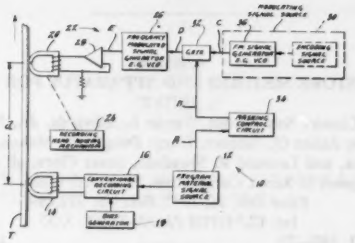
means for executing reading operation in which said repeat-data stored in said memory is read out corresponding to said address signal and is fed to said machine tool control section when said third command code (G24) is decoded, and repeating said reading operation until said numerical value which represents the number of repetition is nulled.

4,086,634

METHOD AND APPARATUS FOR PREPARING RECORDED PROGRAM MATERIAL TO PREVENT UNAUTHORIZED DUPLICATION BY MAGNETIC TAPE RECORDING

Emory G. Cook, Wilton, Conn., assignor to Cook Laboratories, Inc., Norwalk, Conn.

Filed Jul. 30, 1975, Ser. No. 600,455
Int. Cl.[2] G11B *15/04, 5/02*
U.S. Cl. 360—60 **26 Claims**



1. A method for preparing recorded audible program material which does not interfere with normal playback of the material but which renders detectable any unauthorized copies of the audible program material upon a magnetic recording tape which are made by magnetic tape recording with conventional high frequency bias, said method comprising:

recording the audible program material for providing a predetermined information passband of frequencies of such recorded material;

generating a high frequency modulated signal which varies in a predetermined manner over a selected spectrum of frequencies lying just above and outside of said information passband of frequencies; and

recording the modulated signal together with the audible program material;

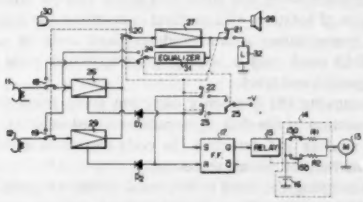
whereby copying of the recorded audible program material onto magnetic tape will produce on the tape copy detectable interference signals between the modulated signal and the conventional recording bias signal.

4,086,635

RECORDING AND REPRODUCING APPARATUS WITH TAPE SEED DEPENDENT ON HEAD SELECTION

Sinichi Saitou, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 30, 1975, Ser. No. 645,440
Int. Cl.[2] G11B *15/10, 15/44, 19/18*
U.S. Cl. 360—73 **4 Claims**



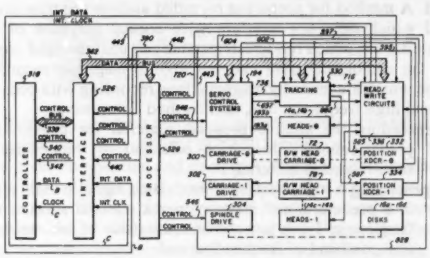
1. A recording and reproducing apparatus comprising a plurality of recording and reproducing heads arranged for a corresponding number of recording tracks; a recording speed setting means including a switch for manually setting a record-

ing speed specified for each of said tracks, said recording speed setting means including a flip-flop circuit, a first means for setting said flip-flop circuit when said recording speed setting means set a first recording speed, a second means for resetting said flip-flop circuit when said recording speed setting means set a second recording speed, and a speed control circuit for driving a recording medium at said frst or second recording speed in accordance with outputs of said flip-flop circuit; and a reproducing speed setting means including means for supplying a reproduction signal produced from a first one of said plurality of recording and reproducing heads to a set terminal of said flip-flop circuit and for supplying a reproduction signal produced from a second one of said plurality of recording and reproducing heads to a reset terminal of said flip-flop circuit.

4,086,636
RESTORE METHOD AND APPARATUS FOR DISK DRIVE

Stipe Cizmic, San Mateo; Wayne L. Edwards, Jr., Mountain View; James O. Jacques, Tracy; Douglas K. Mahon, Boulder Creek, and Leonard R. Shenfield, Santa Clara, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 28, 1977, Ser. No. 772,698
Int. Cl.[2] G11B *21/02, 21/08, 5/55*
U.S. Cl. 360—75 **11 Claims**



1. In a disk drive comprising at least one recording disk rotatable about its axis, said disk having a recording surface divided into a plurality of data-field tracks onto which data may be recorded and a plurality of guard-band tracks onto which data may not be recorded, an electromagnetic read/write head for recording data onto and reading data from said data-field tracks, a head carriage assembly to which said head is mounted, and means for moving said head carriage assembly and thus said head in reciprocal movements relative to the axis of rotation of said disk whereby said head can be positioned over any one of said data-field and guard-band tracks; a method for restoring the head from a position between the data field track located closest to the axis of rotation of said disk and the data field track located furthest from said axis of rotation, to a position over said data field track located furthest from said axis of rotation, said method comprising the steps of:

(a) prerecording a first predetermined code on each data field track and a second predetermined code on each guard-band track;

(b) moving the head in a direction away from the axis of rotation of the disk at a predetermined velocity;

(c) reading and detecting the code stored on each track as the head is moved thereover;

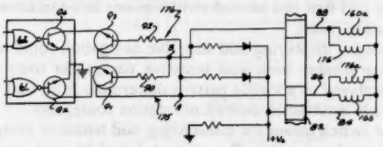
(d) stopping the head over a track when the code read and detected therefrom is said second predetermined code; and

(e) moving the head in a direction toward the axis of rotation of the disk and stopping the head over the data-field track located furthest from said axis of rotation.

4,086,637
METHOD AND APPARATUS FOR LOADING FLEXIBLE MAGNETIC RECORDING DISCS TO TRANSDUCING HEADS

Jan Hendrik Helbers, Ann Arbor, Mich., assignor to Sycor, Inc., Ann Arbor, Mich.

Division of Ser. No. 529,489, Dec. 4, 1974, Pat. No. 3,975,774. This application Mar. 19, 1976, Ser. No. 668,409
Int. Cl.[2] G11B *21/22, 5/54, 15/60*
U.S. Cl. 360—105 **8 Claims**

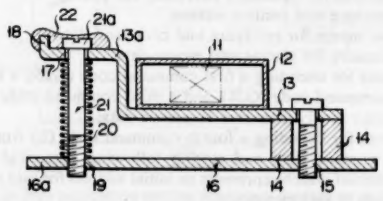


1. In a recorder/reproducer device using a thin, flexible magnetic disc as the recording media, the improvement comprising: a pair of magnetic heads for recording or reproducing operation on opposite sides of said disc, and means mounting said heads on opposite sides of said disc; means for moving said disc and a selected one of the heads in said pair thereof relative to and independently of the other head in said pair, to bring the disc and the selected one head closely adjacent one another and into transducing relation; said means for moving including a selectively operable actuator means for each of said heads producing movement of that head; and means for controlling said means for moving to preclude operation of the actuator means which would produce movement to bring the disc and said other head into transducing relation at the same time as the disc and said selected one head are in said transducing relation.

4,086,638
DEVICE FOR FITTING A MAGNETIC HEAD OF A TAPE RECORDER

Shoichi Saito, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 17, 1977, Ser. No. 797,688
Claims priority, application Japan, May 17, 1976, 51-62406[U]
Int. Cl.[2] G11B *5/56, 21/24*
U.S. Cl. 360—109 **7 Claims**



1. An adjustable mount for mounting a magnetic head of a tape recorder, to a panel of the tape recorder comprising a head base fixed on the panel of the tape recorder; a head fixing plate supporting the magnetic head; support means mounting one end of the head fixing plate above the head base; an azimuth adjustment screw having one end supported by the head base and the other end extended through the other end of the head fixing plate; urging means resiliently biasing said other end of the head fixing plate in the vertical direction away from the head base; rotating means disposed at the other end of the azimuth adjustment screw so as to cooperate, when turned, with the azimuth adjustment screw to move the head fixing plate vertically against the urging means; a projection integrally formed with the other end of the head fixing plate, said

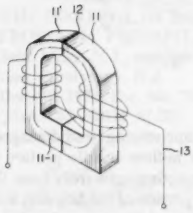
projection extending out of the plane of said other end of the head fixing plate; and a bonding agent fixing the rotating means integrally with the projection to prevent the rotating means from being turned.

4,086,639

MAGNETIC HEAD WHICH MINIMIZES THE EFFECT OF MINUTE VARIATIONS IN THE HEAD GAP

Naohiko Toshimitsu, Chichibu, Japan, assignor to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, both of, Japan

Filed Sep. 27, 1976, Ser. No. 726,751
Claims priority, application Japan, Sep. 29, 1975, 50-117522
Int. Cl.[2] G11B *5/16, 5/20, 5/22*
U.S. Cl. 360—126 4 Claims



1. A magnetic head comprising:

core halves including a highly permeable material of a DC specific permeability ranging from 8000 to 50,000, said core halves abutting on each other to establish a ring-shaped closed magnetic circuit therethrough and a gap of 1 μm to 2.5 μm in width therebetween; and

coils wound on said core halves;

said core halves having a thickness such that a permeability drop starting frequency determined by core loss of the highly permeable material is from 10 Hz to 200 Hz, thereby minimizing influence on frequency characteristics of the head due to variations in width of the gap.

4,086,640

PARTITIONABLE PORTABLE FLEXIBLE DISK PACK

Herbert Underwood Ragle, Thousand Oaks, and Dean L. DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

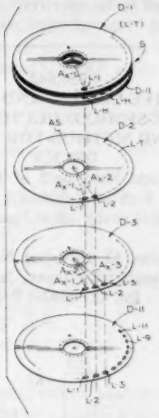
Filed Aug. 4, 1976, Ser. No. 711,647
Int. Cl.[2] G11B *23/02, 25/04*
U.S. Cl. 360—133 6 Claims

1. A portable partitionable pack of flexible disks comprising:

a plurality of like flexible recording disks, the disks being formed and arranged in a concentric stack so that the stack is "partitionable end-wise" rather than from the side;

each said disk of said stack having a central bore for engaging disk pack rotation means and an encoded arrangement of "partition apertures" provided about at least part of a common arcuate segment relatively concentric with the disk center;

the disks being attached together adjacent this central bore and being formed and stacked so that these segments register and so that predetermined, superposed apertures of different disks lie in registry to thereby generate at least one set of "blind deflection bores" extending through the stack from one end thereof, each such bore in a set terminating at a respective different disk in the stack, so as to accommodate the selective partitioning deflection of said respective disk in cooperation with "end-wise partition means" adapted to be selectively thrust along any such bore which has been registered with it.

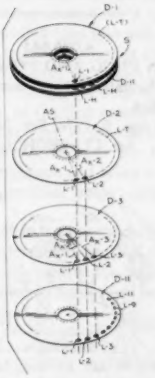


4,086,641

PARTITIONABLE PORTABLE FLEXIBLE DISK PACK

Herbert Underwood Ragle, Thousand Oaks, and Dean DeMoss, Camarillo, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 711,647, Aug. 4, 1976. This application Feb. 7, 1977, Ser. No. 766,288
Int. Cl.[2] G11B *23/02, 25/04*
U.S. Cl. 360—133 19 Claims



1. A portable partitionable disk pack comprising:

a plurality of like flexible recording disks, the disks being formed and arranged in a concentric stack so that the stack is "partitionable end-wise" rather than from the side;

each said disk of said stack having a central bore for engaging disk pack rotation means and a common circumferential pattern of partition-apertures provided about at least part of a common arcuate segment relatively concentric with the disk center;

the disks being attached together adjacent this central bore and being formed and stacked in relative angular-misregistration so that predetermined, superposed apertures of different disks lie in registry to thereby generate at least one set of "blind deflection bores" extending through the stack from one end thereof, each such bore in a set terminating at a respective different disk in the stack, so as to

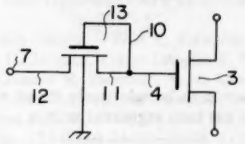
accommodate the selective partitioning deflection of said respective disk in cooperation with "end-wise partition means" adapted to be selectively thrust along any such bore which has been registered with it.

4,086,642

PROTECTIVE CIRCUIT AND DEVICE FOR METAL-OXIDE-SEMICONDUCTOR FIELD EFFECT TRANSISTOR AND METHOD FOR FABRICATING THE DEVICE

Isao Yoshida; Ryoichi Hori, both of Tokyo; Hiroo Masuda; Osamu Minato, both of Kokubunji; Jun Etoh, Hino, and Masaaki Nakai, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 13, 1976, Ser. No. 648,714
Claims priority, application Japan, Jan. 16, 1975, 50-6264
Int. Cl.² H02H *9/04*
U.S. Cl. 361—91 **4 Claims**



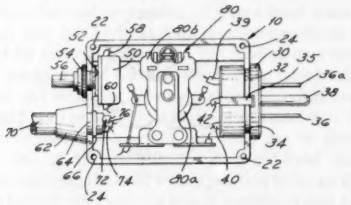
1. A protective circuit for a metal-oxide-semiconductor field effect transistor comprising:
an input terminal to which input signals are applied; and
a depletion-type metal-oxide-semiconductor field effect transistor the gate and source of which are connected to each other, the source of which is connected to the gate of the transistor to be protected, and the drain of which is coupled to said input terminal.

4,086,643

COMBINATION PLUG AND POWER CUT-OFF UNIT

David A. Jacobs, Brighton, Mich., assignor to JDS Products, Inc., Pontiac, Mich.

Filed Apr. 5, 1976, Ser. No. 673,397
Int. Cl.² H02H *3/24*
U.S. Cl. 361—92 **6 Claims**



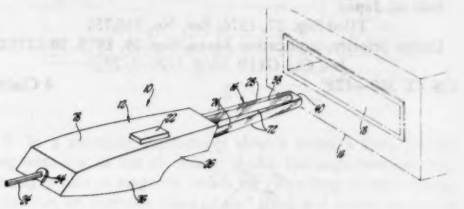
1. A combination plug and power cut-off unit for safety control of power operated devices which comprises:
(a) an elongate shell housing,
(b) a male plug body having electrical contact prongs and provided with an annular recess to receive peripheral portions of an opening in the end of said shell to mechanically lock said plug body in said shell with the prongs outstanding,
(c) a power line retainer at the other end of said shell to mount the end of a power line to carry electrical current to an electrically operated device,
(d) a manually operated push-button type, normally open, switch mounted at said other end of said shell having a push-button outstanding from said shell, and
(e) a relay coil and contacts within said shell to provide a holding circuit around said manually operated switch when power is present in a line into which said prongs are plugged.

4,086,644

MAGNETIC TAPE SENSING HEAD DEMAGNETIZER

Richard C. Horian, 1740 Strickland Dr., Bloomfield Hills, Mich. 48013, and James G. Horian, 7340 Indiana, Dearborn, Mich. 48126

Filed Jun. 14, 1977, Ser. No. 806,416
Int. Cl.² H01F *13/00*
U.S. Cl. 361—149 **6 Claims**



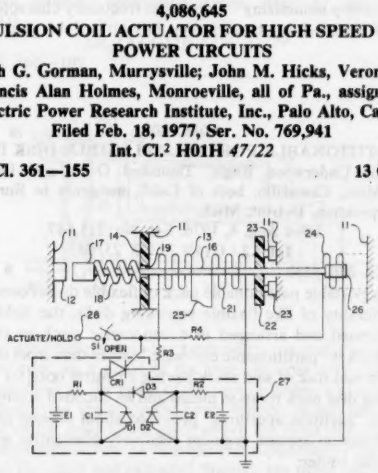
1. A magnetic tape sensing head demagnetizer comprising: a housing having a hollow handle portion and a clear plastic probe portion projecting outwardly from the handle portion; a coil in the handle portion of the housing; a metallic core having an inner end received by the coil and an outer probe end extending outwardly from the handle portion of the housing within the probe portion thereof such that an AC voltage applied to the coil generates a pulsating flux in the probe end of the core for demagnetizing a tape sensing head; a bulb mounted within the handle portion of the housing to shine light outwardly through the probe portion thereof in order to illuminate the tape sensing head and the surrounding area during the demagnetizing and means to selectively apply an AC voltage to said coil and said bulb.

4,086,645

REPULSION COIL ACTUATOR FOR HIGH SPEED HIGH POWER CIRCUITS

Joseph G. Gorman, Murrysville; John M. Hicks, Verona, and Francis Alan Holmes, Monroeville, all of Pa., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 18, 1977, Ser. No. 769,941
Int. Cl.² H01H *47/22*
U.S. Cl. 361—155 **13 Claims**



7. Apparatus for rapid separation of high voltage contacts, comprising
a framework,
a first repulsion coil mounted on said framework,
a second repulsion coil,
said first and second repulsion coils having substantially

colinear axes and producing a repulsion force therebetween when electrically energized,

a moving member attached to said second repulsion coil and disposed for linear motion in the direction of said colinear axes, a static electrical contact on said framework,

a moving electrical contact on said moving member disposed to contact said static electrical contact in the absence of said repulsion force,

a two stage power supply providing a high initial energy transfer rate and a lower sustaining energy transfer rate, said first and second repulsion coils being connected to said two stage power supply,

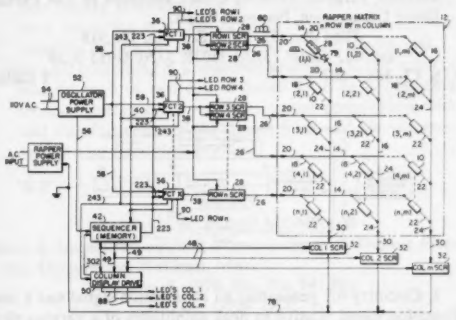
whereby said static and moving contacts are quickly separated by transfer of said high initial energy to said first and second repulsion coils and moved apart a predetermined distance by transfer of said lower sustaining energy to said first and second repulsion coils.

4,086,646

SYSTEM FOR THE CONTROL OF RAPPERS IN AN ELECTROSTATIC PRECIPITATOR

Philip M. Lanese, Belle Mead, N.J., assignor to Belco Pollution Control Corporation, Parsippany, N.J.

Filed Dec. 30, 1976, Ser. No. 755,520
Int. Cl.[2] H01H *47/32*
U.S. Cl. 361—166 **10 Claims**



1. A system for controlling rapping of electrostatic precipitators in which the rappers comprise solenoids the coils of which are arranged in a matrix of rows and columns having corresponding wire circuits for conducting energizing current to each coil comprising

an oscillator power supply providing timing pulse signals of uniform duration for controlling the time rectified A.C. pulses may be applied to each row of rappers;

a plurality of field cycle time circuits connected to said oscillator for controlling the round trip time of each row of rappers, the time each rapper in each row is energized and the current supplied to each rapper during energization;

means for checking each of said solenoids for short circuit and grounding prior to energization;

a sequencer circuit connected to said oscillator and said field cycle time circuits to provide a memory for the system,

row controlled rectifier circuit each being connected to a field cycle time circuit and a corresponding rapper solenoid row wire circuit, and adapted to allow rectified A.C. pulses to be applied to a corresponding rapper solenoid row wire circuit; and

column controlled rectifiers each connected to said sequencer circuit and a corresponding rapper solenoid column wire circuit, whereby

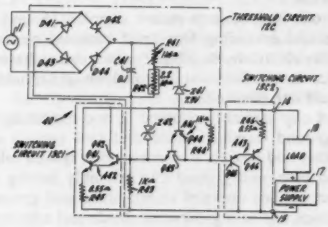
the rectified A.C. pulses are conducted by said wires to said rapper solenoids such that the solenoids in each row are operated in sequence, one at a time only.

4,086,647

AMPLITUDE RESPONSIVE SPEED SWITCH CONTROL

Melvin A. Lace, Prospect Heights, Ill., assignor to Synchro-Start Products, Inc., Skokie, Ill.

Filed Oct. 15, 1976, Ser. No. 732,773
Int. Cl.[2] H02P *5/00*
U.S. Cl. 361—239 **5 Claims**



1. A two-terminal speed switch control actuated in response to changes in the speed of a rotary shaft above and below a threshold speed, comprising:

a multi-pole sub-fractional permanent magnet AC generator, connectable to a rotary shaft, for generating an initial AC signal having an amplitude which varies in accordance with changes in the speed of the shaft;

threshold circuit means, connected to the generator, for developing a DC switch actuation signal whenever the amplitude of the initial AC signal exceeds a given threshold amplitude indicative of a critical shaft speed, the threshold circuit means comprising a full wave rectifier coupled to a first switching amplifier, the output of the first amplifier comprising the DC switch actuation signal;

and a solid-state switching circuit, having two switch terminals connectable in series with an external DC power supply in an operating circuit for a controlled load, for switching the controlled load into and out of its operating circuit in response to the presence or absence of the switch actuation signal, the switching circuit comprising a second switching amplifier having an actuation input connected to the output stage of the first switching amplifier;

the first switching amplifier being maintained non-conductive whenever the output from the rectifier is below a given threshold amplitude and being driven fully conductive whenever the rectifier output exceeds that threshold amplitude;

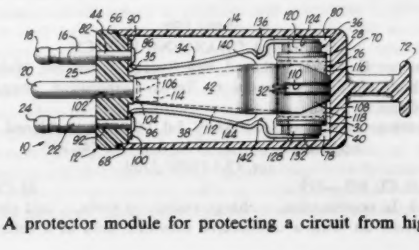
each switching amplifier having its output stage connected across the switch terminals so that the external power supply affords a power source for both amplifiers without requiring any additional connection terminals.

4,086,648

PROTECTOR MODULE

William Hines, Arlington Heights; Eric A. Scheithauer, Chicago, and Casimir Cwirzen, Arlington Heights, all of Ill., assignors to Cook Electric Company, Morton Grove, Ill.

Filed Nov. 1, 1976, Ser. No. 737,326
Int. Cl.[2] H02H *3/22*
U.S. Cl. 361—124 **20 Claims**



1. A protector module for protecting a circuit from high

voltages or surge currents on said circuit, said module comprising:

an insulating base,

terminal means on said base to be coupled to said circuit to be protected,

ground terminal means extending from said base to be coupled to ground potential,

an arrester having a ground electrode and at least one line electrode,

at least one line contact means coupled to said terminal means and extending from said terminal means toward said line electrode, said line contact means having a first contact surface disposed intermediate said terminal means and said line electrode,

a ground clip assembly coupled to and extending between said ground terminal means and said ground electrode such that said arrester is maintained in spaced relationship to said base, said ground clip assembly having a second contact surface disposed intermediate said ground terminal means and said ground electrode and adjacent to said first contact surface, and

a fusible element having a positioning means extending therefrom to engage said line electrode to position said fusible element between said line contact means and said line electrode so as to normally maintain said first contact surface spaced apart from said second contact surface and coupling said line contact means to said line electrode, said first and second contact surfaces making contact whenever said fusible element is not held in position between said line contact means and said line electrode by said positioning means.

4,086,649

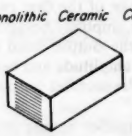
CERAMIC CAPACITOR MADE FROM FIRING SMALL BARIUM TITANATE PARTICLES

R. C. Frederick Hanold, III, Greenville, S.C., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 536,620, Dec. 26, 1974, abandoned. This application Sep. 13, 1976, Ser. No. 722,628

Int. Cl.² H01G *4/12*

U.S. Cl. 361—321 **4 Claims**



1. A high dielectric constant ceramic capacitor having a dielectric constant (K) of at least 10,000 at 25° C, said capacitor comprising in combination a dielectric ceramic body having a predominantly tetragonal crystal structure formed by the firing of ceramic particles at a temperature in the range of about 1250° to 1400° C substantially all of said particles being not larger than 650 A prior to firing, at least 70% by weight of said particles being barium titanate and from about 1 to 30% by weight of said particles being ceramic modifier material in solid solution with barium titanate; and electrodes formed in said body in capacitive relationship.

4,086,650

CORONA CHARGING DEVICE

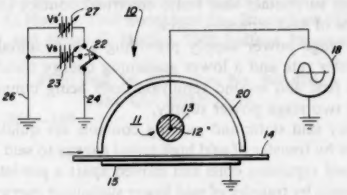
Thomas G. Davis, Pittsford, and George J. Safford, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 595,656, Jul. 14, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,805

Int. Cl.² H05F *3/04*

U.S. Cl. 361—229 **28 Claims**

1. In combination, a charge collecting surface, said surface carried on with a conductive substrate held at a reference potential, a corona discharge member positioned above said surface, said member comprising a thin wire, coated at least in the discharge area with a dielectric material, means for coupling a corona generating a.c. voltage intermediate said sub-



strate and said wire, a conductive shield adjacent said wire and first biasing means for holding said shield at a potential different than said reference potential, said dielectric material having a thickness sufficient to prevent the flow of a net d.c. current though said wire.

4,086,651

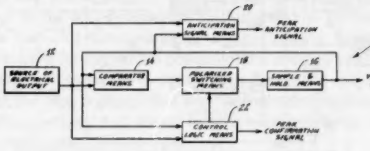
ELECTRICAL OUTPUT PEAK DETECTING APPARATUS

Andrew Redvers Muir, High Wycombe, England, and Joseph Anthony Vergato, Monroe, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Jun. 29, 1976, Ser. No. 700,915

Int. Cl.² G06F *15/20*; H03K *5/20*; G01J *3/28*

U.S. Cl. 364—487 **9 Claims**



1. Circuitry for generating an anticipation signal and a confirmation signal relative to peak amplitudes of a varying electrical output, comprising:

sample and hold means for storing a voltage level;

means for differentially comparing the electrical output with said voltage level;

switching means for polarizing and connecting the output of said comparator means to the input of said sample and hold means;

means for deriving the anticipation signal when a differential exists between said voltage level and the electrical output; and

logic means for controlling said polarized switching means in accordance with slope polarity thresholds of the electrical output relative to said voltage level and deriving the confirmation signal at said thresholds.

4,086,652

METHOD AND APPARATUS FOR ANALYZING A TIME-DEPENDENT PHENOMENON

Arlan Warren Mantz, Acton, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Jan. 19, 1977, Ser. No. 760,701

Int. Cl.² G01V *1/28*; G01B *9/02*

U.S. Cl. 364—525 **13 Claims**

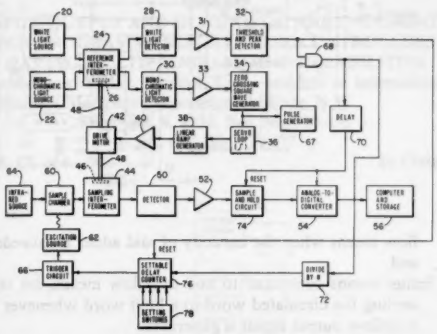
1. A system for resolving a data sequence derived from a time-varying signal-generating phenomenon, said system comprising, in combination:

means for repetitively initiating said phenomenon;

means for detecting signals derived from said phenomenon during the course thereof;

means for repetitively convolving said signals with a transformation;

means for establishing the temporal relation between initiation of said phenomenon and convolution of said signals so that the repetitive convolution produces an ordered set of first interferograms in which the sequence of the phenomenon and the convolution is temporally shifted in successive increments with respect to one another;



means for selecting from each interferogram of said set, a data moiety corresponding to a temporal resolution element occurring at a fixed position in time following said initiation during the course of said interferogram; and

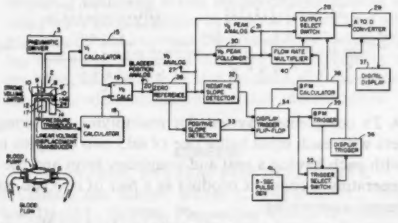
means for combining in a sequence according to the order of said set each of said data moieties so as to synthesize a second interferogram representing the convolution with said transformation of the signals from said phenomenon only at said fixed time position.

4,086,653

PNEUMATIC PUMP MONITOR

David B. Gernes, Watertown, Mass., assignor to Thermo Electron Corporation, Waltham, Mass.

Filed Jan. 9, 1976, Ser. No. 647,841
Int. Cl.[2] G01F *1/00*
U.S. Cl. 364—564 **10 Claims**



1. A device for monitoring the operation of a blood pump, said blood pump having a flexible bladder enclosed by a rigid housing and confining therebetween a closed system of gas, said closed system being adapted to undergo repetitive pressurizations resulting from known and repetitive volumetric compressive displacements for repeatedly volumetrically collapsing said bladder, said monitoring device comprising:

means for receiving a first signal, said first signal being variable as a function of the pressure internal of said closed system;

analog electronic means responsive to said first signal from said first receiving means for substantially continuously generating a second signal functionally related to the loss of volume of said closed system produced by each said repetitive pressurization;

means for generating a third signal varying as a function of said known volumetric compressive displacement; and

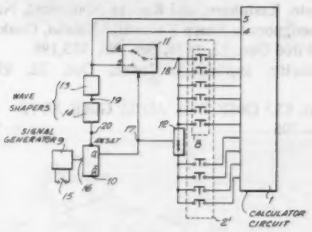
second analog electronic means for subtracting said second signal from said third signal for substantially continuously generating a fourth signal functionally related to the volumetric position of said bladder.

4,086,654

ELECTRONIC TIMEPIECE CALCULATOR

Kazuo Ido, and Mitsuaki Maruyama, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Continuation of Ser. No. 522,085, Nov. 7, 1974, Pat. No. 4,041,295. This application Feb. 10, 1977, Ser. No. 767,272
Int. Cl.[2] G06F *7/48, 15/02*; G04B *19/30*
U.S. Cl. 364—705 **4 Claims**



1. An electronic digital display wristwatch comprising timekeeping circuit means for producing timekeeping signals and calculator circuit means for producing calculating signals, digital display means for displaying one of actual time in response to said timekeeping signals being applied thereto, said display means being further adapted to display calculation information in response to said calculating signals being applied thereto, a plurality of input means adapted to supply to said calculator circuit means data signals representative of numerical information and function signals representative of operating functions to effect processing of said numerical information supplied by said data signals, said calculating circuit means including a function input and a numerical information input, each said input means including a manually operable switch, ten such switches being provided, one for each number of numerical information from 0 to 9 to be applied to the calculator circuit means, control circuit means disposed intermediate each of said manually operable switches and said respective numerical information and function inputs of said calculator circuit means, and one manually operable mode selection switch coupled to said control circuit means for disposing said control circuit means in one of a first numerical input mode and second function performing mode, said control circuit means being adapted to selectively couple either said ten manually operable input switches to said numerical information input of said calculator circuit means when said control circuit means is in a first numerical input mode or at least four of said ten manually operable input switches to said function input of said calculator circuit means in response to said mode selection switch disposing said control circuit means in said second function performing mode, whereby said at least four manually operable switches apply function signals representative of addition, subtraction, multiplication and division to said calculator circuit means to perform said respective functions when said control circuit means is disposed in said second function performing mode, said ten manually operable switches being provided with at least a first terminal, said manually operable switches coupled to said calculator circuit means when said control circuit means is in said second function performing mode having the respective first terminals connected in a first common connection, the balance of said manually operable switches having their respective first terminals connected in a second common connection, said control circuit means including a first electronic switch means interme-

diate said first and second common connection and a second electronic switch means intermediate said first common connection and said calculator circuit means, said first electronic switch means being closed when said control circuit means is in said first numerical input mode and being open when said circuit means is in said second function performing mode, said second electronic switch means coupling said first common connection to said numerical information input of said calculator circuit means when said control circuit means is in said first numerical input mode and to said function input when said control circuit means is in said second function performing mode.

4,086,655

COMBINATION TIMEPIECE AND CALCULATOR INCLUDING SLIDABLE KEYBOARD MEANS

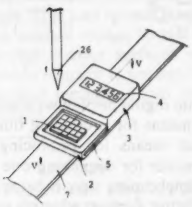
Akira Tanimoto, Kashihara, and Kosuke Nishimura, Nara, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 22, 1976, Ser. No. 753,198

Claims priority, application Japan, Dec. 22, 1975, 50-173814[U]

Int. Cl.[2] G06F *7/38, 15/02;* G04B *37/12*

U.S. Cl. 364—705 **7 Claims**



1. In a combined calculator and timepiece having a main housing, a digital display module in said housing, a timekeeping circuit for driving said display means in a timekeeping mode and a calculator circuit for driving said display means in a calculating mode, the improvement comprising:

a keyboard receiving section in said housing;

a keyboard means mounted in said receiving section for relative movement with said housing between a fully exposed position out of said receiving section and a concealed position in said receiving section; and

mode selector means responsive to the position of said keyboard means to place said combined calculator and timepiece in said timekeeping and calculating modes in said concealed and exposed positions, respectively.

4,086,656

ANALOG-TO-DIGITAL INTEGRATING APPARATUS WITH PULSE DENSITY CONVERSION PRIOR TO ACCUMULATION

James L. Brown, Toddville, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 21, 1976, Ser. No. 734,689

Int. Cl.[2] G06G *7/18;* H03K *13/20*

U.S. Cl. 364—733 **2 Claims**

1. Integrator apparatus comprising, in combination:

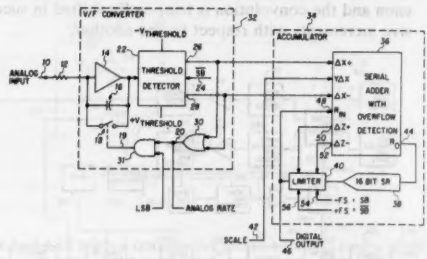
conversion means, including input means and output means, for providing, at said output means, n outputs/second-/volt of analog signal applied to said input means; and

digital accumulator means, including control means connected to said output means of said conversion means, signal input means and digital word output means, for algebraically summing digital words with an accumulated digital value in accordance with the polarity of the analog signal upon receipt of signal at said control means and supplying the result at said digital word output means;

said accumulator means including:

storage means for use in circulating the accumulated digital words;

adder means, including overflow means, for summing the circulated digital word with the input word upon receipt of a control signal and providing an output at said over-



flow means when the capacity of said adder is exceeded; and

limiter means connected to said overflow means, for converting the circulated word to a limit word whenever an overflow output signal is generated.

4,086,657

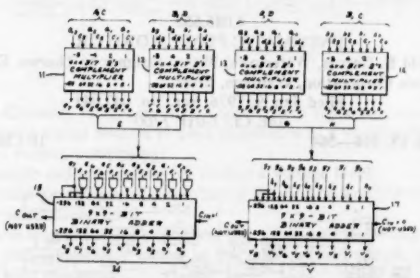
FIVE-STAGE FOUR-BIT COMPLEX MULTIPLIER

James R. Gaskill, Jr., Pacific Palisades, and Lawrence R. Weill, Seal Beach, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 18, 1976, Ser. No. 715,581

Int. Cl.[2] G06F *7/52*

U.S. Cl. 364—757 **9 Claims**



1. A 2's complement system for multiplying two complex numbers with each input being one of said two complex numbers with each having a real and imaginary term and the system generating a complex product as a pair of real and imaginary terms, comprising:

a. a pair of real and a pair of imaginary 4×4 bit 2's complement multipliers with the multipliers having as inputs said two complex numbers and having output bits with the pair of real multipliers providing two most significant bits;

b. a first subtractor section fed by each of the six least significant bits of each of the outputs of the pair of real multipliers generating the six least significant bits of the real term of the complex product with the first subtractor section also generating a carry bit;

c. a second subtractor section fed by the two most significant bits of each of the pair of real multipliers and fed by a carry bit generated by the first subtractor section generating the three most significant bits of the real term of the complex product;

d. a first adder section fed by the first six least significant output bits of each of the pair of imaginary multipliers

generating the six least significant bits of the imaginary term of the complex product and a carry bit;

e. a second adder section fed by the two most significant bits of each of the imaginary multipliers and fed by a carry bit generated by the first adder section generating the three most significant bits of the imaginary term of the complex product.

4,086,658

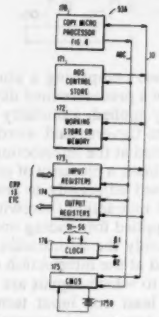
INPUT/OUTPUT AND DIAGNOSTIC ARRANGEMENTS FOR PROGRAMMABLE MACHINE CONTROLLERS HAVING MULTIPROGRAMMING CAPABILITIES

David Ernest Finlay, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,451

Int. Cl.[2] G06F *13/00*

U.S. Cl. 364—900 **14 Claims**



1. A data processing apparatus including a data processing unit having a given memory address space identified by an address field having a plurality of bits,

a control memory connected to said data processing unit for receiving said plurality of bits and having registers addressable within a portion of said address space,

a read/write memory connected to said data processing unit for receiving said plurality of bits and having registers addressable in a second portion of said address space, said read/write memory being divided into address zones requiring switching action by the data processing unit to address memory registers in various zones and a plurality of input/output registers connected to said data processing unit to be addressed thereby by said plurality of bits for being addressable in said memory address space common to predetermined ones of said address zones.

4,086,659

CONTROL SYSTEM FOR DISK DRIVE

Stipe Cizmic, San Mateo; Wayne L. Edwards, Jr., Mountain View; David L. Griffith, Pleasanton; Martin O. Halfhill, San Jose; James O. Jacques, Tracy; Leonard R. Shenfield, Santa Clara, and Ronald W. Votaw, Morgan, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Feb. 28, 1977, Ser. No. 773,102

Int. Cl.[2] G11B *17/00;* **G06F** *13/08*

U.S. Cl. 364—900 **18 Claims**

1. A disk drive comprising:

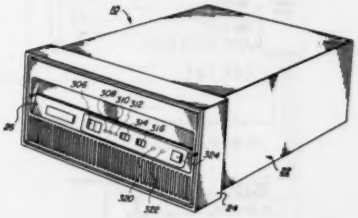
a housing having a door through which a cartridge including a recording disk therein may be inserted;

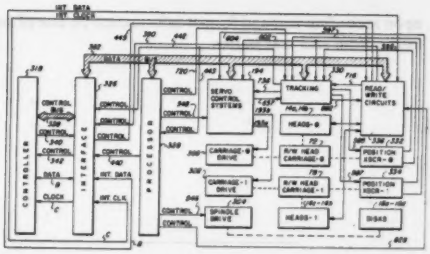
a spindle drive assembly mounted in said housing and responsive to a first set of instructions for rotating the recording disk of a disk cartridge loaded into said housing through said door and onto said spindle drive assembly;

an actuator mounted in said housing and capable of controlled reciprocal movements relative to the axis of rotation of said spindle drive assembly;

a head carriage assembly mounted in said housing to said actuator and including at least one electromagnetic read/write head thereon for reading data from and writing data onto tracks of the recording disk of a cartridge loaded onto said spindle drive assembly;

servo control apparatus mounted in said housing and responsive to a second set of instructions for controlling the speed and direction of the reciprocal movements of said actuator;





read/write apparatus mounted in said housing and responsive to a third set of instructions for controlling the reading and writing of data by said electromagnetic head; and

programmed data processing means mounted in said housing and connected to said spindle drive assembly, said servo control apparatus and said read/write apparatus for generating said first, second and third sets of instructions under program control.

4,086,660

AUTOMATIC FORMAT CONTROL FOR TEXT PRINTING SYSTEM

Michael Eudell McBride, Austin, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,562

Int. Cl.[2] G06F *3/12*

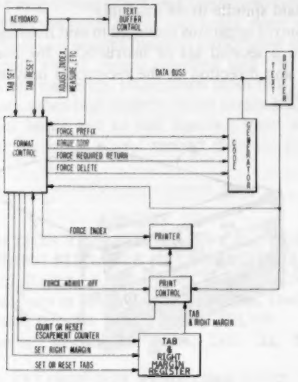
U.S. Cl. 364—900 **2 Claims**

1. An automatic format control for a text printing system having a keyboard, a text buffer for storing a page of text and format information keyed on said keyboard, a printer control, segmented media for storing text and format information, a reader/recorder for reading text and format information from said media and said text buffer and for causing text and format information to be recorded on said media and stored in said text buffer, and

means for causing said printer control to be set upon keying format information on said keyboard; wherein the improvement comprises:

a format buffer; and

means for causing format information representative of said printer control setting to be stored in said format buffer



upon recording text and format information on one of said media from said text buffer.

4,086,661

CYLINDRICAL MAGNETIC DOMAIN ELEMENT

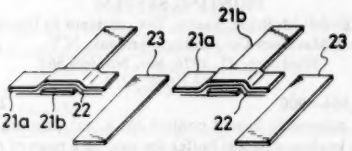
Shunsuke Matsuyama, Tokyo; Junichi Tanahashi, Yamato; Kenso Imamura, Yokohama, and Teiji Majima, Komae, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 7, 1975, Ser. No. 556,402

Claims priority, application Japan, Mar. 14, 1974, 49-29387; May 9, 1974, 49-51499

Int. Cl.² G11C *19/08*

U.S. Cl. 365—39 **8 Claims**



3. A cylindrical magnetic domain element comprising a magnetic sheet material having a first surface; and a multi-layered propagation pattern on said first surface; said multi-layered propagation pattern comprising a first layer of permalloy propagation pattern segments having uniaxial magnetic anisotropy, a second layer of permalloy propagation pattern segments having uniaxial magnetic anisotropy and a layer of non-magnetic material separating said first and second layers.

4,086,662

MEMORY SYSTEM WITH READ/WRITE CONTROL LINES

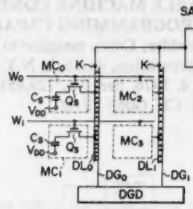
Kiyoo Itoh, Higashikurume, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 11, 1976, Ser. No. 713,580

Claims priority, application Japan, Nov. 7, 1975, 50-133078; Jan. 26, 1976, 51-6669

Int. Cl.² G11C *7/00, 11/24*

U.S. Cl. 365—189 **7 Claims**



1. A memory system comprising a plurality of word lines arranged in parallel in a predetermined direction and to which signals are selectively applied, a plurality of information lines arranged in parallel to traverse said word lines, a plurality of memory cells connected at the intersections of said word lines and said information lines, a plurality of control lines arranged in parallel and disposed adjacently to respective information lines to provide field interaction therewith and to which signals are selectively applied for reading out on the corresponding information line only the information stored in a selected memory cell arranged at the intersection of a selected control line and a word line to which signals are applied, and a sense amplifier having at least one input terminal to which said information lines are connected in common.

4,086,663

MIXING APPARATUS AND METHOD

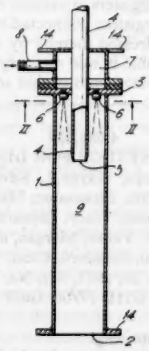
Peter Croft, Ilkley, England, assignor to Allied Colloids Limited, Bradford,, England

Filed Jun. 15, 1976, Ser. No. 696,172

Claims priority, application United Kingdom, Jun. 21, 1975, 26465/75

Int. Cl.² B01F *15/02*

U.S. Cl. 366—154 **11 Claims**



1. A device comprising a duct open at a first end, a solid inlet for feeding particulate solids entrained in a stream of gas centrally into the duct at or near its second end with a direction of flow generally towards the first end, a plurality of sprays arranged around said solid inlet for spraying liquid into the duct as a spray of mist particles that substantially fills the width of the duct and that travels generally towards the first end and means for injecting said solids through said solids inlet into the duct with a swirling action.

DESIGN PATENTS

GRANTED APRIL 25, 1978

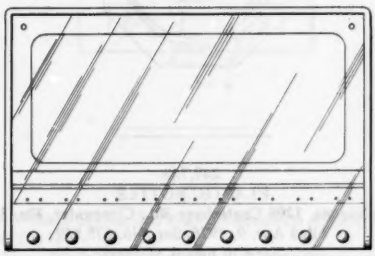
ERRATA

For CLASS	See PATENT NO.
D10-119	247,785

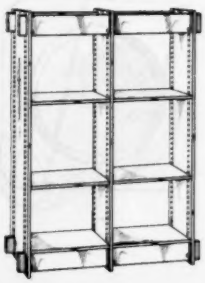
DESIGNS

APRIL 25, 1978

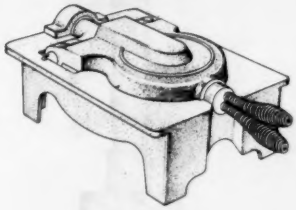
247,761
JEWELRY CADDY
Gladys Albert, Bayside, N.Y., assignor to Gladys Albert, Bayside, N.Y.
Filed Jun. 7, 1976, Ser. No. 693,275
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—132



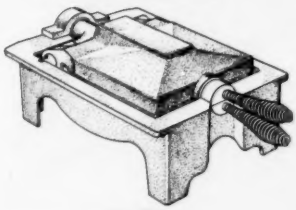
247,762
SHELF UNIT OR SIMILAR ARTICLE
Kleber Lenoir, Montreal, Canada, assignor to R. S. Furniture Inc., Montreal, Canada
Filed Feb. 26, 1976, Ser. No. 661,759
Claims priority, application Canada, Oct. 20, 1975, 201075
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—186



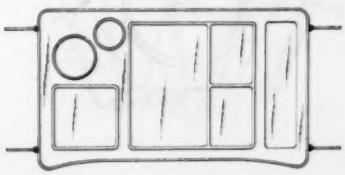
247,763
WAFFLE BAKER
Fred S. Carbon, 105 Days Ave., Buchanan, Mich. 49107
Filed May 12, 1976, Ser. No. 685,937
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—87



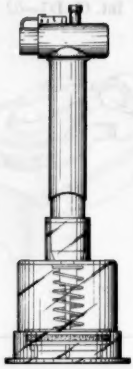
247,764
WAFFLE BAKER
Fred S. Carbon, 105 Days Ave., Buchanan, Mich. 49107
Division of Ser. No. 685,937, May 12, 1976. This application Aug. 5, 1977, Ser. No. 821,980
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—87



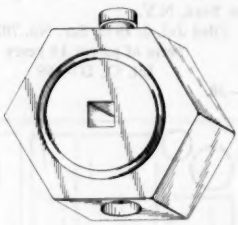
247,765
FOOD SERVICE TRAY
Dorothy Pariente, New York, N.Y., assignor to Dorothy Pariente, New York, N.Y.
Filed Jul. 2, 1976, Ser. No. 702,197
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—38



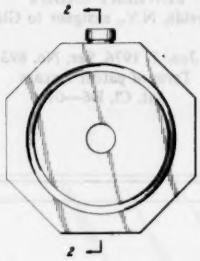
247,766
SELF CLEANING DESOLDERING TOOL COMBINATION OR THE LIKE
William S. Fortune, 14250 Dearborn St., Panorama City, Calif. 95969
Filed May 13, 1976, Ser. No. 686,230
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



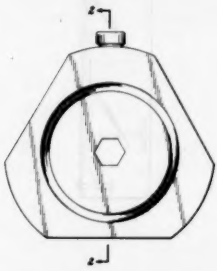
247,767
PLASTIC BOTTLE
Charles Sagona, 1209 Canterbury Rd., Clearwater, Fla. 33516
Filed Mar. 24, 1976, Ser. No. 669,904
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—130



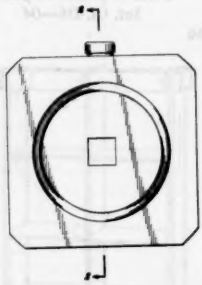
247,768
PLASTIC BOTTLE
Charles Sagona, 1209 Canterbury Rd., Clearwater, Fla. 33516
Filed Mar. 24, 1976, Ser. No. 669,905
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—130



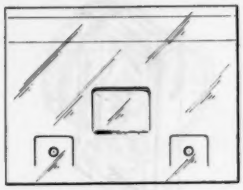
247,769
PLASTIC BOTTLE
Charles Sagona, 1209 Canterbury Rd., Clearwater, Fla. 33516
Filed Apr. 9, 1976, Ser. No. 675,549
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—156



247,770
PLASTIC BOTTLE
Charles Sagona, 1209 Canterbury Rd., Clearwater, Fla. 33516
Filed Apr. 9, 1976, Ser. No. 675,548
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—168

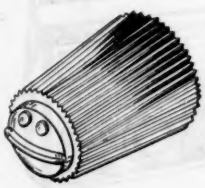


247,771
DISPLAY CARD FOR EARRINGS OR THE LIKE
Paul Moskowitz, Brooklyn, N.Y., assignor to Kim Craftsmen, Ltd., New York, N.Y.
Filed Aug. 6, 1976, Ser. No. 712,266
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—191



247,772
CAN
Edward William Sexton, Jr., 990 Massachusetts Ave., Arlington, Mass. 02174
Filed Sep. 27, 1976, Ser. No. 726,439
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—218

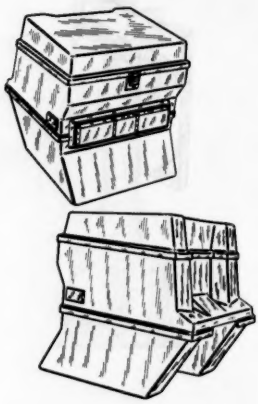
247,773
DISPENSER CAP
Silas Charles Topham, 665 E. 1500 South, Orem, Utah 84057, and Ariel R. Davis, 3476 Fleetwood Dr., Salt Lake City, Utah 84110
Filed Sep. 10, 1976, Ser. No. 721,932
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—278



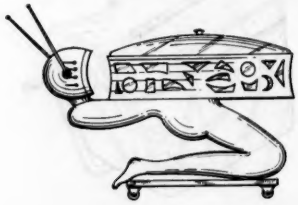
247,774
WALL PLAQUE
Keith A. Underwood, 919 S. High St., Urbana, Ohio 43078
Filed Mar. 22, 1976, Ser. No. 669,178
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—132

247,775
MOTOR CYCLE SIDE PANNIER
Leonard Watson-O'Hara, Manchester, England, assignor to Screenflow Accessories Limited, Bolton, England
Filed Nov. 16, 1976, Ser. No. 742,504
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158

247,776
CYCLE SADDLEBOX
Ralph Kramer, 2628 Powhattan Pkwy., Toledo, Ohio 43606
Filed May 16, 1977, Ser. No. 797,584
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—158



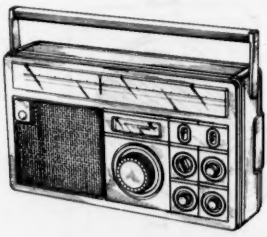
247,777
HOUSING FOR AUDIO-VISUAL ENTERTAINMENT SYSTEM OR SIMILAR ARTICLE
Donald Roberson, 3312 Cedarbrook, Cleveland Hts., Ohio 44118
Filed Aug. 16, 1976, Ser. No. 714,643
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—1



247,778
TAPE CASSETTE CASE
Daizi Nagatomo, Yohohama, Japan, assignor to Sony Corporation
Filed Mar. 9, 1976, Ser. No. 663,122
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—11

247,779
DESK TOP COMPUTER
Richard G. Barnich, Grand Blanc, and Gary D. Johnson, Brighton, both of Mich., assignors to Process Computer Systems, Inc., Mich.
Filed Aug. 9, 1976, Ser. No. 712,525
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—45

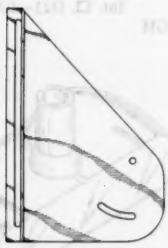
247,780
PORTABLE RADIO
Takeyoshi Kawano, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Feb. 4, 1976, Ser. No. 655,193
Claims priority, application Japan, Aug. 9, 1975, 50-32735
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



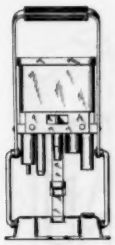
247,781
OUTER RACE FOR BALL BEARING
Edward DiLoreto, Downey, Calif., assignor to Yale Engineering Company, Downey, Calif.
Filed Aug. 2, 1976, Ser. No. 710,510
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—143

247,782
LENS CAP RETAINER
Armond Blumberg, 312 A Plochman La., Woodstock, N.Y. 12498
Filed Nov. 29, 1976, Ser. No. 745,961
Term of patent 7 years
Int. Cl. D16—*99*
U.S. Cl. D16—50

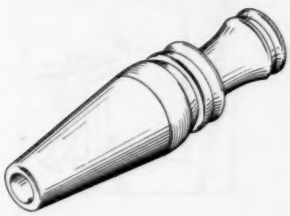
247,783
MOUNTING PLATE FOR ARCHERY BOW SIGHTS
Gerald I. Killian, 16016 SE. 82nd Dr., Clackamas, Oreg. 97015
Filed Mar. 25, 1976, Ser. No. 670,394
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—5



247,784
SHOTGUN SHELL LOADING PRESS
Richard J. Lee, R.R. 2, Hartford, Wis. 53027
Filed Feb. 23, 1976, Ser. No. 660,488
Term of patent 14 years
Int. Cl. D22—*99*
U.S. Cl. D22—99



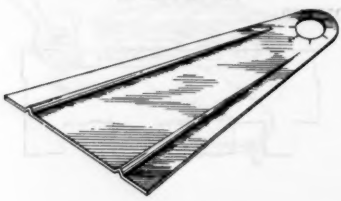
247,785
GAME CALL
Robert D. Ehrich, 435 Edgewater Dr., Mishawaka, Ind. 46544
Filed Sep. 30, 1976, Ser. No. 728,390
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—119



247,786
ROOFING SHINGLE
David N. Flood, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.
Filed Mar. 31, 1976, Ser. No. 672,347
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

247,787
LIGHTER
Robert James Weir, London, England, assignor to Alfred Dunhill Limited, London, England
Filed Nov. 1, 1976, Ser. No. 737,583
Claims priority, application United Kingdom, Jul. 2, 1976, 976328/76
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—36

247,788
HAIR SPRAY SHIELD FOR ATTACHMENT TO SPRAY CANS
George S. Bernyk, 2501 W. Redondo Beach Blvd., Gardena, Calif. 90249
Filed Feb. 26, 1976, Ser. No. 661,706
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—9

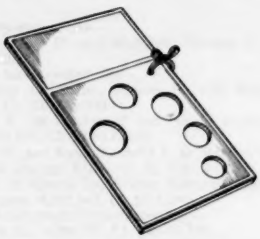


247,789
EXERCISER
Marcel Belkir, 1701 York Ave., Apt. 25-C, New York, N.Y. 10028
Filed Sep. 24, 1976, Ser. No. 726,251
Term of patent 14 years
Int. Cl. D21—*02*; D34—*5 A*
U.S. Cl. D34—5 K

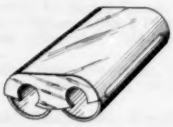
247,790
COMBINED GOLF BALL MARKER AND DIVOT REPLACEMENT TOOL
Albert P. Jackson, 6521 Washington St., Des Moines, Iowa 50311
Filed Oct. 26, 1976, Ser. No. 735,530
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB

247,791
GOLF PUTTING HEAD
Salvatore Monteleone, 18275 Parthenia St., Northridge, Calif. 91324
Filed Nov. 8, 1976, Ser. No. 739,560
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH

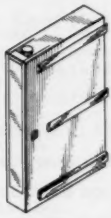
247,792
NOVELTY DIGIT COUNTER
Edward G. Matay, 1231 E. Jackson St., Joliet, Ill. 60432
Filed May 5, 1976, Ser. No. 684,261
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 R



247,793
COIN CONTAINER
Peter A. McCarthy, 106 Athens Ave., South Amboy, N.J. 08879
Filed Aug. 23, 1976, Ser. No. 716,880
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D52—4 R



247,794
TAPE CASSETTE CASE
Keizaburo Tazawa, Tokyo; Shinichiro Takahashi, Yokohama, and Kishio Ikeda, Tokyo, all of Japan, assignors to Sony Corporation
Filed Jan. 26, 1976, Ser. No. 648,863
Claims priority, application Japan, Jul. 14, 1975, 50-29230
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



247,795
PUSH SYMBOL FOR GLASS DOOR OR THE LIKE
Jack Darrell, 1646 Old Spanish Trail, Houston, Tex. 77054
Filed Mar. 16, 1977, Ser. No. 778,274
Term of patent 14 years
Int. Cl. D20—*03;* D8—*99*
U.S. Cl. D96—12 C

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PATENTS WERE ISSUED ON THE 25TH DAY OF APRIL, 1978

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Scheffler, Friedrich; and Stangl, Ernst, 4,086,462, Cl. 219-10.710.

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Gonda, Shunichi, 4,086,108, Cl. 148-175.000.
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Aizawa, Hideo: *See*—
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Kreitzberg, Ernest A., 4,085,834, Cl. 192-87.130.

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Martin, Edward S.; and Wohleber, David A., 4,086,320, Cl. 423-135.000.

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Diehl, Robert Eugene; and Kendall, Roger Vernon, 4,086,242, Cl. 260-308.00B.
Matsuda, Ken; and Barber, William Austin, 4,086,275, Cl. 260-561.00N.
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Anderson, Robert L.: *See*—
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Eremin, Gennady Efimovich. Production of vodka. 4,086,366, Cl. 426-14.000.

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Saito, Toranosuke; Kitani, Masakatu; Mori, Kenshi; and Izawa, Shinichi, 4,086,206, Cl. 260-45.8NT.

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Bowen, Edward George; Mounts, Frank William; and Netravali, Arun Narayan, to Bell Telephone Laboratories, Incorporated. Processor for increasing the run-length of facsimile data. 4,086,620, Cl. 358-260.000.

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Brakelmann, Heinrich, to Felten & Guilleaume Carlswerk AG. Three-phase cable system with compensation of longitudinal voltages induced in accompanying return-flow pipes for cooling water. 4,086,425, Cl. 174-15.00C.

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Braun, Anton. Free piston engine with opposed cylinders. 4,085,711, Cl. 123-46.00B.

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Brown, Clifford K. Shoulder strap guard. 4,085,465, Cl. 2-271.000.

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Brown, James L., to Rockwell International Corporation. Analog-to-digital integrating apparatus with pulse density conversion prior to accumulation. 4,086,656, Cl. 364-733.000.

Brown, James N., to Minnesota Mining and Manufacturing Company. Rubbery cushion having pressure-sensitive adhesive layer. 4,086,388, Cl. 428-315.000.

Brown, John Anthony; and Wilkie, Leslie Raymond, to Numol Corporation. Wax mould apparatus. 4,086,046, Cl. 425-361.000.

Brown, Johnny Milton: *See—*
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Brown, Manuel D. Tool box mount for pickup truck. 4,085,961, Cl. 296-37.600.

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Bruscato, Frank N.; and Danti, August G. Pharmaceutical tablets containing chitin as a disintegrant. 4,086,335, Cl. 424-180.000.

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America, Navy. Rotational energy absorbing coupling. 4,086,012, Cl. 403-2.000.
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Burgess, Keith D.: *See—*
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Burrage, Benjamin Stuart. Urinary drainage bag. 4,085,755, Cl. 128-295.000.
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Burstrom, Martin; Larker, Hans; and Nilsson, Jan, to ASEA AB. Method and apparatus for plastic deformation at high ambient pressure. 4,085,605, Cl. 72-54.000.
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Butler, Roger Moore, to Exxon Production Research Company. Method for oil recovery using a horizontal well with indirect heating. 4,085,803, Cl. 166-303.000.
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Bylo, John J. Logistical support of offshore drilling facilities. 4,085,695, Cl. 114-260.000.
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Travis, Sigmund D., 4,085,943, Cl. 279-1.00K.
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Cahn, Robert P.; and Li, Norman N., to Exxon Research & Engineering Co. Metal extraction by combined solvent and LM extraction. 4,086,163, Cl. 210-22.00D.
Cairns, James L. Sealed connector with barriers to contact bridging. 4,085,993, Cl. 339-94.00M.
Caixes, Antonio Montserrat: *See—*
Balana, Ramon Cairo; and Caixes, Antonio Montserrat, 4,086,135, Cl. 195-17.000.
Calder, Brooke J., Jr.; Belock, Robert J.; and Prescott, Roger N., to Austin Powder Company. Elongated flexible detonating device. 4,085,676, Cl. 102-23.000.
Cameron, Robert W., to Timken Company, The. Double row bearing assembly with tapered roller bearings. 4,085,984, Cl. 308-207.00A.
Campbell, Louis; and Keshock, Edward G. Record carrier. 4,085,875, Cl. 224-45.00K.
Campbell Soup Company: *See—*
Egee, Walter W.; and Cramer, Clarence W., 4,085,563, Cl. 53-59.00R.
Canadian Patents & Development Limited: *See—*
Nigrin, Jan, 4,086,543, Cl. 330-287.000.
Canale, James. Colostomy bag pad. 4,085,752, Cl. 128-283.000.
Canon Denshi Kabushiki Kaisha: *See—*
Toshimitsu, Naohiko, 4,086,639, Cl. 360-126.000.
Canon Kabushiki Kaisha: *See—*
Ishikawa, Kazuo; Sakaguchi, Keiichi; Takigawa, Tomoshi; Hirata, Noritsugu; Tajima, Akira; and Tsuji, Sadahiko, 4,086,605, Cl. 354-270.000.
Ito, Fumio; Ito, Tadashi; Mashimo, Yukio; Sakurada, Nobuaki; and Shinoda, Nobuhiko, 4,086,581, Cl. 354-23.00D.
Kawanabe, Tsuyoshi; and Machida, Minoru, 4,086,588, Cl. 340-365.00S.
Kiyohara, Takehiko; Tsunekawa, Tokuichi; Yazaki, Mutsunobu; Sanada, Noriaki; Taguchi, Tetsuya; and Nakamura, Zenzo, 4,086,582, Cl. 354-33.000.
Kozuki, Susumu; Ichiyanagi, Toshikazu; Watanabe, Yoshiaki; Uchiyama, Takashi; and Sunouchi, Akio, 4,086,584, Cl. 354-38.000.
Kozuki, Susumu; Uchiyama, Takashi; Ito, Tadashi; Iwashita, Tomonori; Uchidoi, Masanori; and Mashimo, Yukio, 4,086,603, Cl. 354-204.000.
Toshimitsu, Naohiko, 4,086,639, Cl. 360-126.000.
Capriotti, Alfred J.; and Lazzaretti, Louis G., to United States Steel Corporation. Continuous caster-alignment apparatus. 4,085,513, Cl. 33-286.000.
Caputo, William R.; and De Lorenzi, John J., to Westinghouse Electric Corporation. Elevator system. 4,085,823, Cl. 187-29.00R.
Caravito, Vito A., to Goodyear Tire & Rubber Company, The. Integrally built and cured tire and wheel assembly. 4,085,786, Cl. 152-158.000.
Carbonnel, Henri, to Groupement pour les Activites Atomiques et Avancees "GAAA" S.A. Method of preparing insulating refractory products and the product thereof. 4,086,057, Cl. 106-64.000.
Carding Specialists Co. Limited: *See—*
Varga, John Maximilian Jules, 4,085,977, Cl. 302-28.000.
Cardy, Charles Frederick, to Interox Chemicals Ltd. Process for preparing poly(ε-caprolactone) polyurethanes. 4,086,214, Cl. 260-77.5AN.
Carl Still Recklinghausen, Firma: *See—*
Teschner, Wolfgang; and von Massow, Hans-Jurgen, 4,085,852, Cl. 214-17.00R.
Carlow, Earl F.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mathys, Wilbur L.; Mensch, William D., Jr.; Orgill, Rodney H.; Peddle, Charles I.; and Wiles, Michael F., 4,086,627, Cl. 364-200.000.
Carlson, Elmer A., to International Telephone and Telegraph Corporation. Spark ignited recycling ignition system with interlocking gas valve control. 4,086,048, Cl. 431-46.000.
Carlson, Harold W. Vaccine and medicament dispensing system. 4,085,782, Cl. 141-1.000.
Carr, Francis L.: *See—*
Beck, William P.; Carr, Francis L.; and Gronwick, Jerry P., 4,085,503, Cl. 30-34.100.
Cartier, Roger J.: *See—*
Robandt, William F.; Cartier, Roger J.; and Gay, Sandy C., 4,086,553, Cl. 336-192.000.
Cartmell, Donald K.; and Witzke, Horst, to Optel Corporation; and Grumman Aerospace Corporation, part interest to each. Multi-compartment photogalvanic cell. 4,086,398, Cl. 429-111.000.
Carty, Daniel T.; and Oline, James A., to Rohm and Haas Company. Blends of thermoplastic polymer with a multi-phase acrylic composite polymers. 4,086,296, Cl. 260-857.00G.
Caruel, Jacques Emile Jules; and Stora, Guy Daniel, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Gas-turbine combustor having an air-cooled shield-plate protecting its end closure dome. 4,085,581, Cl. 60-39.660.
Cassandrini, Paolo; and Tozzi, Antonio, to Chimosa Chimica Organica S.p.A. Novel polytriazine compounds. 4,086,204, Cl. 260-45.8NT.
Cassandrini, Paolo; and Tozzi, Antonio, to Chimosa Chimica Organica S.p.A. Polyurea compounds which improve the light stability of polymers. 4,086,207, Cl. 260-45.80N.
Castiglia, Ignatius F., to Lenox Hill Brace Shop, Inc. Ankle wrap. 4,085,746, Cl. 128-166.000.
Castiglia, Ignatius F., to Lenox Hill Brace Shop. Weight-redistribution orthopedic appliance. 4,085,758, Cl. 128-589.000.
Cataffo, Herman R.; and De Meo, Anthony J. Method and means for repairing damaged vinyl sheets. 4,086,113, Cl. 156-98.000.
Catano, Paul S.; and Richards, William E., to United States of America, Navy. All-weather multi-spectral imaging system. 4,086,616, Cl. 358-81.000.
Caterpillar Tractor Co.: *See—*
Bailey, John M., 4,085,722, Cl. 123-139.0AL.
Miller, Lindell L., 4,085,815, Cl. 180-54.00R.
Papasideris, Stamos I., 4,085,833, Cl. 192-4.00B.
Waudoit, Claude A., 4,085,920, Cl. 251-57.000.
Causey, G. Donald: *See—*
Graupe, Daniel; and Causey, G. Donald, 4,086,435, Cl. 179-1.50R.
Cella, James A., to General Electric Company. Method of applying and curing epoxy coating compositions using dicarbonyl chelate of group IIIa–Va element and UV irradiation. 4,086,091, Cl. 96-36.200.
Cengel, John A.; and Puskas, Imre, to Standard Oil Company (Indiana). Process for manufacturing polyalkenyl succinic anhydrides. 4,086,251, Cl. 260-346.740.
Centre Europeen de Recherches Mauvernay: *See—*
Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; Simond, Jacques; and Monteil, Andre, 4,086,352, Cl. 424-270.000.
Centre Europeen de Recherches Mauvernay "C.E.R.M.": *See—*
Mauvernay, Roland-Yves; Pourrat, Henri-Jean; and Lamaison, Jean-Louis, 4,086,216, Cl. 260-112.00R.
Century Mfg. Co.: *See—*
Smith, Leonard S., 4,086,551, Cl. 336-45.000.
Cerny, Louis F. Ladder leveler. 4,085,820, Cl. 182-204.000.
Cervoni, Peter P.; and Wolf, Peter S., to USV Pharmaceutical Corporation. Treatment of asthma. 4,086,363, Cl. 424-330.000.
CHA Industries: *See—*
Mahl, Gunard O. B., 4,085,699, Cl. 118-500.000.

Chadwick, Duane G. Method of producing egg cooking indicator. 4,085,493, Cl. 29-455.00R.
Chahroudi, Day, to Energy Materials, Inc. Transparent thermal insulating system. 4,085,999, Cl. 350-1.100.
Chambers, Alan F., to Nylite Skate Company of Canada Ltd. Composite skate assembly. 4,085,944, Cl. 280-11.120.
Chambron, Edmond, to Compagnie Generale de Radiologie. Method and apparatus for controlling the movement of fluid to and from a syringe. 4,085,749, Cl. 128-215.000.
Champlin, Charles L., to Packaging Corporation of America. Air filter assembly. 4,086,071, Cl. 55-501.000.
Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Tetramethyl chromanyl pentane amide. 4,086,249, Cl. 260-345.500.
Chandramouli, Pitchaiya: *See—*
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,086,125, Cl. 156-62.200.
Chang, Chen-Kun. Device for preventing collision of trains. 4,085,913, Cl. 246-63.00A.
Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., to Mobil Oil Corporation. Conversion of synthesis gas to hydrocarbon mixtures. 4,086,262, Cl. 260-449.60R.
Charron, Gerard. Meat tendering machine. 4,085,482, Cl. 17-26.000.
Chelikowsky, Richard D.; and Stinson, Kenneth R., to Rockwell International Corporation. AM removal and phaselock receiver. 4,086,593, Cl. 343-106.00R.
Chemische Werke Huls Aktiengesellschaft: *See—*
Zerpner, Dieter; Nedden, Klaus Zur; Frese, Albert; and Datene, Hans, 4,086,301, Cl. 260-897.00A.
Chen, Di; and Koepke, Barry G., to Honeywell Inc. Planar optical waveguide. 4,086,001, Cl. 350-96.140.
Chen, Gilbert K. C.: *See—*
Argo, Wesley B.; Chen, Gilbert K. C.; Kocatas, Babur M.; and Ziebold, Steven A., 4,086,070, Cl. 55-97.000.
Cherenko, Joseph P.; and Shaw, Hugh E., Jr., to PPG Industries, Inc. Bilayer windshield with embedded antenna. 4,086,595, Cl. 343-713.000.
Cheshire, David Alan; Debbas, Samir Costandi; Eger, Richard Thomas; Schermacher, Ken Stephen; and Twohig, Paul Thomas, to Du Pont de Nemours, E. I., and Company. Nonwoven polypropylene fabric and process. 4,086,381, Cl. 428-113.000.
Chestel, Inc.: *See—*
Hurle, Robert J., 4,086,440, Cl. 179-81.00R.
Chevron Research Company: *See—*
Lowe, Warren, 4,086,172, Cl. 252-47.500.
Chiba Communications Industries, Inc.: *See—*
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, 4,086,429, Cl. 178-69.100.
Chimosa Chimica Organica S.p.A.: *See—*
Cassandrini, Paolo; and Tozzi, Antonio, 4,086,204, Cl. 260-45.8NT.
Cassandrini, Paolo; and Tozzi, Antonio, 4,086,207, Cl. 260-45.80N.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara: *See—*
Toth, Geza; Toth, Istvan; and Montay, Tibor, 4,086,246, Cl. 260-340.90R.
Chippewa Paper Products Company: *See—*
Klein, Sheldon D., 4,085,970, Cl. 297-440.000.
Chisso Corporation: *See—*
Shirai, Isoo; Suzuki, Takeshi; and Takahashi, Tsutomu, 4,086,185, Cl. 252-429.00B.
Chris-Marin I Malmo AB: *See—*
Christensson, Nils Artur, 4,085,649, Cl. 85-1.00T.
Christensen, Burton G.: *See—*
Firestone, Raymond A.; Ratcliffe, Ronald W.; and Christensen, Burton G., 4,086,423, Cl. 544-21.000.
Christensson, Nils Artur, to Chris-Marin I Malmo AB. Bolt assembly. 4,085,649, Cl. 85-1.00T.
Christian, James Vernon: *See—*
Edwards, Joseph Franklin; Brown, Johnny Milton; Christian, James Vernon; and Elkins, Clayton, 4,085,976, Cl. 302-25.000.
Christiansen, Leo P.: *See—*
Bocchi, Quinto M., 4,086,434, Cl. 179-2.0AM.
Christianson, Neil B. Attic exhaust system. 4,085,667, Cl. 98-43.00R.
Chung, David H., to Fairchild Camera and Instrument Corporation. Microprocessor system. 4,086,626, Cl. 364-200.000.
Chung, San Chi: *See—*
Aronson, Howard A.; and Chung, San Chi, 4,086,532, Cl. 324-166.000.
Churchill, William M. Ticket taking system. 4,086,475, Cl. 235-419.000.
Churchward, Roy Alexander. Golf club. 4,085,934, Cl. 273-171.000.
Ciba-Geigy AG: *See—*
Steiner, Eginhard; and Beffa, Fabio, 4,086,223, Cl. 260-151.000.
Ciba-Geigy Corporation: *See—*
Tournayre, Jean Claude; and Vogel, Christian, 4,086,080, Cl. 71-118.000.
Cichowski, Robert S.; and Farha, Floyd E., Jr., to Phillips Petroleum Company. Oxidative dehydrogenation process. 4,086,290, Cl. 260-680.00E.
Cieslak, Richard F.; and Balding, John V., to Industrial Electronics Service Co. Audible electronic warning system. 4,086,589, Cl. 340-384.00E.
Cincinnati Milacron Inc.: *See—*
Bone, Kendall Frederick, 4,086,456, Cl. 200-82.00E.
Citizen Watch Co. Ltd.: *See—*
Natori, Minoru, 4,085,577, Cl. 58-23.00D.
Cizmic, Stipe; Edwards, Wayne L., Jr.; Jacques, James O.; Mahon, Douglas K.; and Shenfield, Leonard R., to Xerox Corporation. Restore method and apparatus for disk drive. 4,086,636, Cl. 360-75.000.
Cizmic, Stipe; Edwards, Wayne L., Jr.; Griffith, David L.; Halfhill, Martin O.; Jacques, James O.; Shenfield, Leonard R.; and Votaw, Ronald W., to Xerox Corporation. Control system for disk drive. 4,086,659, Cl. 364-900.000.
Claassen, Volkert: *See—*
Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, 4,086,361, Cl. 424-304.000.
Clark, James Monroe: *See—*
Cohen, Stuart Barry; Clark, James Monroe; and Magnus, Arthur Howard, 4,086,436, Cl. 179-15.0AF.
Clark, Lowell E.; and Saltich, Jack L., to Motorola, Inc. High reliability epi-base radiation hardened power transistor. 4,086,610, Cl. 357-34.000.
Clawson, Arthur R.; and Wieder, Herman H., to United States of America, Navy. Light emitting diode. 4,086,608, Cl. 357-17.000.
Claxton, William Eugene, to Firestone Tire & Rubber Company, The. Electronic alarm circuitry. 4,086,564, Cl. 340-58.000.
Clayton & Lambert Manufacturing Company: *See—*
Lambert, Charles F., Jr., 4,085,520, Cl. 34-79.000.
Clovis, James S.: *See—*
Owens, Frederick H.; and Clovis, James S., 4,086,300, Cl. 260-885.000.
CMB Colonia Management-und Beratungsgesellschaft mbH & Co. K.G.: *See—*
Fricke, Jobst; and Geiseler, Wolfgang, 4,085,648, Cl. 84-1.240.
Cohen, Stuart Barry; Clark, James Monroe; and Magnus, Arthur Howard, to International Telephone and Telegraph Corporation. Transmit and receive digital data channel elastic store. 4,086,436, Cl. 179-15.0AF.
Cole-Parmer Instrument Company: *See—*
Hagen, Loren M.; and Desai, Ashwin H., 4,086,036, Cl. 417-413.000.
Collins, Henry R., Jr., to Collins Products Company. Composite sampling system and rotatable sampling valve therefor. 4,085,618, Cl. 73-422.0TC.
Collins, James D., to Westinghouse Electric Corporation. Isolating switch shutter assembly for high voltage motor starter. 4,086,452, Cl. 200-50.0AA.
Collins Products Company: *See—*
Collins, Henry R., Jr., 4,085,618, Cl. 73-422.0TC.
Columbia Research Corporation: *See—*
Murray, Russell, 4,086,497, Cl. 250-562.000.
Commissariat a l'Energie Atomique: *See—*
Peuzin, Jean Claude; and Tasson, Michel, 4,086,124, Cl. 156-603.000.
Commonwealth Scientific and Industrial Research Organization: *See—*
Jackson, Mervyn Benjamin; and Sasse, Wolfgang Hermann Fritz, 4,086,299, Cl. 260-885.000.
Compagnie Generale de Radiologie: *See—*
Chambron, Edmond, 4,085,749, Cl. 128-215.000.
Compagnie Generale d'Electricite S.A.: *See—*
Feuillade, Georges, 4,086,402, Cl. 429-190.000.
Gadessaud, Robert, 4,086,405, Cl. 429-253.000.
Compair Industrial Limited: *See—*
Poole, Eric John, 4,086,019, Cl. 415-18.000.
Compunetics, Incorporated: *See—*
Bernier, Donald R., 4,086,531, Cl. 324-158.0MG.
Conca, Romeo John; Gray, John Patrick; and Sloan, Tod Hunter, to International Telephone and Telegraph Corporation. Process for controlling the intrinsic viscosity of sulfite pulp. 4,086,129, Cl. 162-49.000.
Concept Development Institute, Inc.: *See—*
Morgan, Burton D., 4,086,023, Cl. 416-132.00B.
Congoleum Corporation: *See—*
Barchi, Henry J., 4,086,377, Cl. 427-358.000.
Conner, Gary L., to U.S. Engineering Corporation. Relay. 4,086,550, Cl. 335-132.000.
Conradty, C.: *See—*
Koziol, Konrad; Sieberer, Karl-Heinz; and Rathjen, Hans-Carl, 4,086,157, Cl. 204-290.00F.
Consaul, James William; and Jadwin, Thomas Arthur, to Eastman Kodak Company. Offset prevention during fixing. 4,085,702, Cl. 118-60.000.
Container Corporation of America: *See—*
Beck, Robert E., 4,085,842, Cl. 206-289.000.
Continental Oil Company: *See—*
Johnson, Gary R., 4,086,412, Cl. 528-499.000.
Sifferman, Thomas R.; and Sparlin, Derry D., 4,085,801, Cl. 166-295.000.
Sifferman, Thomas R.; and Sparlin, Derry D., 4,085,802, Cl. 166-295.000.
Cook Electric Company: *See—*
Hines, William; Scheithauer, Eric A.; and Cwirzen, Casimir, 4,086,648, Cl. 361-124.000.
Cook, Emory G., to Cook Laboratories, Inc. Method and apparatus for preparing recorded program material to prevent unauthorized duplication by magnetic tape recording. 4,086,634, Cl. 360-60.000.
Cook Laboratories, Inc.: *See—*
Cook, Emory G., 4,086,634, Cl. 360-60.000.
Cooper, Charles Simpson: *See—*
Lawson, John B.; Cooper, Charles Simpson; and Vail, Alfred Slocum, 4,085,547, Cl. 51-47.000.

Cooperativa Central dos Produtores de Acucar E Alcool do Estado de Sao Paulo: *See—*
Da Silva, Wilson Marcelo, 4,085,545, Cl. 47-58.000.

Coppola, Vincent G.; Manduley, Flavio M.; and Dlugos, Daniel F., to Pitney-Bowes, Inc. Detection circuit for monitoring the failure of a system to respond in a planned manner to an inputted control signal. 4,086,530, Cl. 324-133.000.

Cor Tech Research Ltd.: *See—*
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,086,125, Cl. 156-62.200.

Cordier, Jean-Pierre; and Vandorpe, Marc, to Belgonucleaire, S.A. Process for drying solutions containing boric acid. 4,086,325, Cl. 423-280.000.

Corey, Harold, to Population Research Incorporated. Method of bacterially purifying methyl cyanoacrylate. 4,086,266, Cl. 260-465.400.

Corey, Max L. Wood splitter. 4,086,111, Cl. 144-193.00A.

Corning Glass Works: *See—*
Minot, Michael Jay; and Ortabasi, Ugur, 4,086,074, Cl. 65-31.000.
Seward, Thomas Philip, III; and Wedding, Brent Merle, 4,086,089, Cl. 96-27.00R.

Corson, Frederick P.: *See—*
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., 4,086,151, Cl. 204-159.160.

Cosby, James L.; and Morgret, Gordon L., to Koppers Company, Inc. Web guides for corrugator machines. 4,086,120, Cl. 156-473.000.

Cosden Technology, Inc.: *See—*
Watson, James M., 4,086,147, Cl. 203-9.000.

Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, to Rhone-Poulenc Industries. Naphthyridine derivatives. 4,086,348, Cl. 424-256.000.

Coudray, Andre Lucien: *See—*
Henrion, Michel Andre Robert; and Coudray, Andre Lucien, 4,086,437, Cl. 179-15.0AF.

Coughenour, Donald Jay; and Brown, Jack, to Singer Company, The. Sewing machine with programmable memory. 4,085,691, Cl. 112-158.00E.

Council, Malcolm N., to Otis Engineering Corporation. Well tubing handling system. 4,085,796, Cl. 166-77.500.

Cowardin, Robert Lewis; and Laurer, George Joseph, to International Business Machines Corporation. Decoding method and circuit. 4,086,477, Cl. 235-464.000.

Cowley, Gerald; Swindells, Richard; and Kostanecki, Mark, to Erco Industries Limited. Integrated chlorine dioxide producing system. 4,086,329, Cl. 423-478.000.

Cox, Arthur; and Linke, Walter R., to Bell & Howell Company. Viewfinder optics with zero power doublet. 4,086,000, Cl. 350-54.000.

Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., to Pfizer Inc. Phenyl-alkanolamine, alkylamine and alpha-aminoalkyl ketone derivatives as heart stimulants. 4,086,272, Cl. 260-559.00D.

CPC International Inc.: *See—*
Balana, Ramon Cairo; and Caixes, Antonio Montserrat, 4,086,135, Cl. 195-17.000.

Cramer, Clarence W.: *See—*
Egee, Walter W.; and Cramer, Clarence W., 4,085,563, Cl. 53-59.00R.

Crane, Hewitt David; and Wolf, Daniel Errol, to Stanford Research Institute. Handwriting verification system using landmarks. 4,086,567, Cl. 340-146.3SY.

Crane Packing Limited: *See—*
Wilkinson, Samuel Clifford Walter; Sweett, Ronald Sydney; and Bunyan, Thomas Walter, 4,085,941, Cl. 277-3.000.

Crane, Robert M.; and Redwine, Fletcher H., to United States Steel Corporation. Method and apparatus for flushing the plunger of a positive displacement pump. 4,086,029, Cl. 417-53.000.

Crawford, Duncan J.: *See—*
Lisiecki, Robert E.; Crawford, Duncan J.; and Wise, Daniel J., 4,085,885, Cl. 229-17.00R.

Crawford, Lynn D., to Genevieve I. Hanscom, Robert M. Magnuson & Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson. Apparatus for conveying and turning articles. 4,085,839, Cl. 198-410.000.

Crenshaw, Marilyn: *See—*
Martinsons, Aleksandrs; and Crenshaw, Marilyn, 4,086,149, Cl. 204-59.00R.

Cresswell, Michael W., to Westinghouse Electric Corporation. Method of fabricating apertured deposition masks used for fabricating thin film transistors. 4,086,127, Cl. 156-643.000.

Crisan, Cornel: *See—*
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, 4,086,348, Cl. 424-256.000.

Crisp, Michael J.: *See—*
Krikorian, Esther; and Crisp, Michael J., 4,086,555, Cl. 338-15.000.

Croft, Peter, to Allied Colloids Limited. Mixing apparatus and method. 4,086,663, Cl. 366-154.000.

Cross, David Frederic Watson: *See—*
Hutton, Ronald Eric; and Cross, David Frederic Watson, 4,086,304, Cl. 260-989.000.

Crouzet: *See—*
Cadot, Robert G., 4,086,527, Cl. 324-233.000.

Crowe, Norman P.; and Lohse, Joseph M., to Multifold-International, Inc. Machine for stacking and casing articles. 4,085,566, Cl. 53-124.00D.

Crowell Corporation, The: *See—*
Adelman, Herbert B.; and Goodman, Jack, 4,086,384, Cl. 428-213.000.

Crutcher, James Elwyn: *See—*
VanderLinden, Paul Guisbert, Jr.; and Crutcher, James Elwyn, 4,086,599, Cl. 343-881.000.

Curling, John Malcolm: *See—*
Lindquist, Lars-Olof Edvard; Berglof, Jan Hakan; and Curling, John Malcolm, 4,086,222, Cl. 260-122.000.

Curran, John R.; Sgourakes, George E.; and Richardson, David A., to Foxboro Company, The. Vortex flow meter transducer. 4,085,614, Cl. 73-194.0VS.

Currie, David W. Spring-hook device for scoring in a target type game. 4,085,933, Cl. 273-95.00R.

Currie, George Daniel, to Environmental Research Institute of Michigan. Method for fabrication of integrated optical circuits. 4,085,501, Cl. 29-593.000.

Curry, Byron V.; and Walton, Michael G. Adjustable spray device. 4,085,895, Cl. 239-276.000.

Curtiss-Wright Corporation: *See—*
Myers, David M.; and Lamping, Harold D., 4,085,712, Cl. 123-205.000.

Cushman, David W.; and Ondetti, Miguel Angel, to E. R. Squibb & Sons, Inc. N-carboxyalkanoyl derivatives of azetidine-2-carboxylic acid. 4,086,338, Cl. 424-244.000.

Cwirzen, Casimir: *See—*
Hines, William; Scheithauer, Eric A.; and Cwirzen, Casimir, 4,086,648, Cl. 361-124.000.

Cybernet Electronic Corporation: *See—*
Teshirogi, Toshihiko, 4,086,545, Cl. 331-16.000.

Czyzewski, Ted S.: *See—*
Minifie, Bernard W.; and Czyzewski, Ted S., 4,086,371, Cl. 426-658.000.

Dadak, Zdenek; Janda, Jaroslav; and Kakac, Karel, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Arrangement for the control of weft introduced into looms. 4,085,777, Cl. 139-370.200.

Dahl, John Conlan; and Barnett, David Lee, to Three Phoenix Company. Magnetic tape cartridge transport. 4,085,906, Cl. 242-192.000.

Dahlem, Werner, to Rheinstahl AG. Shield tubbing for longwalls. 4,085,592, Cl. 61-45.00D.

Daicel Ltd.: *See—*
Toyoshima, Iwao; Ishii, Kunio; Sawada, Hideo; Kawamoto, Junji; and Yokota, Hiromu, 4,085,760, Cl. 131-268.000.

Daimler-Benz Aktiengesellschaft: *See—*
Holzapfel, Immanuel; and Bruder, Werner, 4,085,579, Cl. 60-39.040.
Schaal, Christian, 4,085,718, Cl. 123-119.00A.
Sieder, Wolfgang, 4,086,554, Cl. 338-2.000.
Weisshappel, Helmut; Klie, Wolfgang; and Fischer, Wolfgang, 4,085,956, Cl. 293-86.000.
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Willmann, Karl; and Saufferer, Helmut, 4,085,717, Cl. 123-119.00E.

Dajani, Esam Z.: *See—*
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,086,227, Cl. 260-239.00B.

Dalton, Robert E. Continuously energized electrostatic coating voltage block. 4,085,892, Cl. 239-15.000.

Damhaug, Torbjorn: *See—*
Skarheim, Hans Petter; and Damhaug, Torbjorn, 4,086,169, Cl. 210-519.000.

D'Amico, John J.: *See—*
Bollinger, Frederic G.; and D'Amico, John J., 4,086,078, Cl. 71-94.000.

Danfoss A/S: *See—*
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Daniel, Jean-Claude, to Rhone-Poulenc Industries. Latices of polymer particles comprising a core containing a vinyl polymer and a periphery containing a polymer having —CN groups. 4,086,199, Cl. 260-29.7UP.

Danti, August G.: *See—*
Bruscato, Frank N.; and Danti, August G., 4,086,335, Cl. 424-180.000.

D'Antonio, Alfred: *See—*
Putnam, Roger L., Jr.; Provost, Richard H.; and D'Antonio, Alfred, 4,085,567, Cl. 53-225.000.

Darden, Donald R. Alignment device. 4,085,515, Cl. 33-377.000.

Da Silva, Wilson Marcelo, to Cooperativa Central dos Produtores de Acucar E Alcool do Estado de Sao Paulo. Device for the extraction of sugar cane gemmas destined to thermotherapic treatment for the control of the blight of sugar cane stumps left after cutting. 4,085,545, Cl. 47-58.000.

Datene, Hans: *See—*
Zerpner, Dieter; Nedden, Klaus Zur; Frese, Albert; and Datene, Hans, 4,086,301, Cl. 260-897.00A.

Daum, Gerhard; and Richtzenhain, Hermann, to Dynamit Nobel Aktiengesellschaft. Method of preparing 3-methyl pyridine. 4,086,237, Cl. 260-290.00P.

Dauth, Christoph: *See—*
Borowski, Eva; Braun, Klaus; Breuel, Klaus; Dauth, Christoph; Erge, Dieter; Grawert, Werner; Groger, Detlev; Hohne, Liselotte; Knothe, Edda; Muller, Monika; Nordmann, Gisela; Schirutschke, Rudolf; and Volzke, Klaus-Dieter, 4,086,141, Cl. 195-81.000.

David, Ed B., to EMC Energies, Inc. Free fluid-operated well turbopump. 4,086,030, Cl. 417-88.000.

Davidson, Charles Patrick Duncan; and Bottoms, Harry Simister, to Lucas Industries Limited. Motorized bicycle. 4,085,814, Cl. 180-33.00C.

Davies, Glyndwr John, to Glacier Metal Company Limited, The. Polyphenylene sulphide applications. 4,086,376, Cl. 427-185.000.
Davis, John R.: *See—*
LaChapelle, Theodore J., Jr.; Davis, John R.; and Licari, James J., 4,086,375, Cl. 427-90.000.
Davis, Paul D., Jr.: *See—*
Ezell, George D.; Murphy, Marvin L., Jr.; and Davis, Paul D., Jr., 4,086,504, Cl. 340-15.5TS.
Davis, Thomas G.; and Safford, George J., to Xerox Corporation. Corona charging device. 4,086,650, Cl. 361-229.000.
Dawson, John Victor; and Lalich, Michael John, to British Cast Iron Research Association. Cast iron. 4,086,086, Cl. 75-130.00R.
Day, Paul L.; and Mucha, George M., to Park-Ohio Industries, Inc. Resistance heating device with improved workpiece feeding mechanism. 4,086,464, Cl. 219-156.000.
Dayco Corporation: *See—*
Gaworowski, Andrew J.; and Duckett, John C., 4,086,386, Cl. 428-307.000.
Debbas, Samir Costandi: *See—*
Cheshire, David Alan; Debbas, Samir Costandi; Eger, Richard Thomas; Schermacher, Ken Stephen; and Twohig, Paul Thomas, 4,086,381, Cl. 428-113.000.
DeCaro, Robert E.: *See—*
Shapiro, Haskell; and DeCaro, Robert E., 4,085,619, Cl. 73-462.000.
De Clippeleir, Georges; and Vanderlinden, Andre, to Labofina S. A. Process for preparing overbased calcium sulfonates. 4,086,170, Cl. 252-33.000.
Decoteau, Gary D.: *See—*
Bosley, Roy E.; Mann, Paul T.; Decoteau, Gary D.; Ivie, Kert F.; and Winslow, Elden D., 4,086,368, Cl. 426-464.000.
Degraeve, Frans: *See—*
Mortier, Frans H.; and Degraeve, Frans, 4,085,571, Cl. 56-208.000.
Delagrange, Arthur D., to United States of America, Navy. Translating filter. 4,086,540, Cl. 328-167.000.
Delery, Marc, to Trappeur, S. A. Ski-boot. 4,085,528, Cl. 36-121.000.
De Lorenzi, John J.: *See—*
Caputo, William R.; and De Lorenzi, John J., 4,085,823, Cl. 187-29.00R.
Demchuk, Alexandr Fedorovich: *See—*
Deribas, Andrei Andreevich; Demchuk, Alexandr Fedorovich; Braunshtein, Rudolf Aronovich; Bochkarev, Boris Nikolaevich; Viktorov, Vladimir Borisovich; Karkishko, Gennady Semenovich; Baranov, Sergei Vasilievich; Prakhov, Alexandr Ivanovich; Kasatkin, Vladimir Semenovich; and Rozhkov, Alexandr Timofeevich, 4,085,883, Cl. 228-2.500.
De Meo, Anthony J.: *See—*
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Demi, Roy C.: *See—*
Branson, Charles D.; and Demi, Roy C., 4,085,891, Cl. 236-15.00A.
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Ragle, Herbert Underwood; and DeMoss, Dean, 4,086,641, Cl. 360-133.000.
DeMoss, Dean L.: *See—*
Ragle, Herbert Underwood; and DeMoss, Dean L., 4,086,640, Cl. 360-133.000.
Dentsply Research & Development Corporation: *See—*
Spencer, Bruce J., 4,085,967, Cl. 297-115.000.
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Derrick, H. William, Jr., to Derrick Manufacturing Corporation. Flow divider. 4,085,776, Cl. 137-561.00A.
Derrick Manufacturing Corporation: *See—*
Derrick, H. William, Jr., 4,085,776, Cl. 137-561.00A.
Desai, Ashwin H.: *See—*
Hagen, Loren M.; and Desai, Ashwin H., 4,086,036, Cl. 417-413.000.
Desyllas, Peter Leo Lawrence; Jones, John Austin; and Procter, Brian John, to International Computers Limited. Hierarchical data store with look-ahead action. 4,086,629, Cl. 364-200.000.
Deutsch, Leslie J.: *See—*
Deutsch, Ralph; and Deutsch, Leslie J., 4,085,644, Cl. 84-1.010.
Deutsch, Ralph; and Deutsch, Leslie J., to Deutsch Research Laboratories, Ltd. Polyphonic tone synthesizer. 4,085,644, Cl. 84-1.010.
Deutsch Research Laboratories, Ltd.: *See—*
Deutsch, Ralph; and Deutsch, Leslie J., 4,085,644, Cl. 84-1.010.
Deverin, Jacques Alain, to Societe Suisse pour l'Industrie Horlogere Management Services, S.A. Monocrystalline display device with storage effect for an electronic timepiece. 4,085,576, Cl. 58-23.00R.
De Vos, Daniel: *See—*
Le Ruyet, Daniel; and De Vos, Daniel, 4,086,098, Cl. 106-97.000.
Dewey, Frank. Rigid composite articles and a method for their manufacture. 4,086,118, Cl. 156-246.000.
Diaferia, Henry V.: *See—*
DiMatteo, Paul L.; and Diaferia, Henry V., 4,085,471, Cl. 5-90.000.
Dickalian, Ghazi Mourad, to Exxon Research & Engineering Co. Pitch bonded carbon electrode. 4,086,156, Cl. 204-294.000.
Dickey, Herbert C., to Ealing Corporation, The. Electrical switch for use by the disabled. 4,086,458, Cl. 200-85.00R.
Dickey-john Corporation: *See—*
Bachman, Wesley J., 4,086,563, Cl. 340-52.00B.
Steffen, David Eugene, 4,085,862, Cl. 221-8.000.
Dickson, Jocelyn: *See—*
Hermann, William J., Jr., 4,086,060, Cl. 23-259.000.
Didier-Werke AG: *See—*
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Diebold, Incorporated: *See—*
Beck, Robert; Morello, Herbert J.; and Richardson, Jack M., 4,085,687, Cl. 109-24.100.
Diehl, Robert Eugene; and Kendall, Roger Vernon, to American Cyanamid Company. 1H- and 2H-Benzotriazoles. 4,086,242, Cl. 260-308.00B.
Dieleman, Jan; and Hoeberechts, Arthur Marie Eugene, to U.S. Philips Corporation. Camera tube employing silicon chalcogenide target with heterojunction. 4,086,512, Cl. 313-366.000.
Diesel Kiki Co., Ltd.: *See—*
Shibuya, Tsunenori; and Kondo, Hiroshi, 4,086,040, Cl. 418-76.000.
Takada, Haruhiko, 4,086,041, Cl. 418-84.000.
Dilo, Richard, to Rontex America, Inc. Method of producing needled, non-woven tubing. 4,085,486, Cl. 28-110.000.
DiMatteo, Paul L.; and Diaferia, Henry V., to Dynell Electronics Corporation. Invalid bed arrangement. 4,085,471, Cl. 5-90.000.
DiMatteo, Paul L., to Dynell Electronics Corporation. Invalid bed arrangement. 4,085,472, Cl. 5-90.000.
Dimensional Development Corporation: *See—*
Wah Lo, Allen Kwok; and Nims, Jerry Curtis, 4,086,585, Cl. 354-115.000.
Dimick, Royal H. Fifth wheel trailer home with folding forward section. 4,085,959, Cl. 296-23.0MC.
Director National Research Institute for Metals, The: *See—*
Masumoto, Katashi; Furubayashi, Ei-ichi; and Inoue, Wahei, 4,086,508, Cl. 310-86.000.
Djordjevic, Ilija; Jaenke, Hans-Jurgen; Ritter, Ernst; and Staudt, Heinrich, to Robert Bosch GmbH. Fuel regulator for internal combustion engines with injection system. 4,085,724, Cl. 123-140.0MC.
Dlugos, Daniel F.: *See—*
Coppola, Vincent G.; Manduley, Flavio M.; and Dlugos, Daniel F., 4,086,530, Cl. 324-133.000.
Dobritz, Gunter, to Dragerwerk Aktiengesellschaft. Humidifier for respirators having a sealed container water supply to a water storage tank. 4,086,305, Cl. 261-30.000.
Dodge, Larry H., to Sherwood Medical Industries Inc. Drainage apparatus. 4,085,751, Cl. 128-275.000.
Dodson, Raymond M.; and Hanson, Joseph B., to University of Minnesota, The Regents of the. Preparation of catechol derivatives. 4,086,265, Cl. 260-455.00A.
Dombay, Zsolt: *See—*
Matolcsy, Gyorgy; Bordas, Barna; Bokor, Gyorgy; Dombay, Zsolt; Pinter, Zoltan; Gregar, Erzsebet, nee Toth; Dudas, Julianna, nee Sz. Kiss; Nagy, Emilia, nee Gera; and Fodor, Istvan, 4,086,339, Cl. 424-245.000.
Donn Products, Inc.: *See—*
Lahm, Albert H., 4,086,480, Cl. 362-148.000.
Dorigotti, Luciano; and Parravicini, Francesco, to I.S.F. SpA. Acylated hydrazinopyridazine antihypertensives. 4,086,343, Cl. 424-250.000.
Dorn, Ingo H.: *See—*
Stedefeder, Joachim; Dorn, Ingo H.; Kuhn, Horst; Kastenhuber, Walter; and Linke, Wolfgang, 4,086,413, Cl. 528-499.000.
Dorr-Oliver Incorporated: *See—*
Jukkola, Walfred Wilhelm; and Svencer, Richard Ernest, 4,085,516, Cl. 34-10.000.
Dorsch, Robert; and Leach, Daryl, to Alpha-Debon Industries, Inc. Apparatus and spray head for fluid dispersion. 4,085,896, Cl. 239-504.000.
Douglas, Lawrence M., to Polaroid Corporation. Selective closure of camera viewfinder and camera incorporating same. 4,086,604, Cl. 354-219.000.
Dover Corporation: *See—*
Minifie, Bernard W.; and Czyzewski, Ted S., 4,086,371, Cl. 426-658.000.
Dow Chemical Company, The: *See—*
Barrons, Keith C.; Smith, Leonard L., Jr.; and Holmsen, Theodore W., 4,086,081, Cl. 71-126.000.
Baxter, Clyde Edward; and Gurgiolo, Arthur Emilio, 4,086,159, Cl. 208-333.000.
Berazosky, Sandra; and Kaiser, Mark E., 4,086,273, Cl. 260-561.00S.
Hopper, Charles R.; and Kershner, Larry D., 4,086,253, Cl. 260-396.00N.
Huang, Charles Y.; and Stavropoulos, William S., 4,086,142, Cl. 195-103.50R.
Kaiser, Mark E.; and Owen, Peter W., 4,086,274, Cl. 260-561.00S.
Lamoria, Lz F.; and Van Dell, Robert D., 4,086,200, Cl. 260-29.60S.
McCarthy, James R.; and Moore, Jimmie L., 4,086,344, Cl. 424-251.000.
Peters, James; VanDell, Robert D.; Eash, R. Douglas; and Lamoria, Lz F., 4,086,201, Cl. 260-29.70S.
Raley, Charles F., Jr., 4,086,192, Cl. 260-2.5FP.
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., 4,086,151, Cl. 204-159.160.

Doyle, William C., Jr., to Gulf Research & Development Company. Combating unwanted vegetation with 1,3,4-thiadiazolylureas. 4,086,077, Cl. 71-90.000.

Dragerwerk Aktiengesellschaft: *See*—
Dobritz, Gunter, 4,086,305, Cl. 261-30.000.

Drechsel, Erhart K., to Pennzoil Company. Production of fluoride-free phosphates. 4,086,322, Cl. 423-158.000.

Dryden, Hugh Latimer, Jr.; and Erickson, Robert A., to G. D. Searle & Co. Process for the preparation of tertiary amines. 4,086,234, Cl. 260-268.0BC.

Du Pont of Canada Ltd.: *See*—
Kuhnemann, Klaus Dieter, 4,085,903, Cl. 242-43.100.

Duckett, John C.: *See*—
Gaworowski, Andrew J.; and Duckett, John C., 4,086,386, Cl. 428-307.000.

Dudas, Julianna, nee Sz. Kiss: *See*—
Matolcsy, Gyorgy; Bordas, Barna; Bokor, Gyorgy; Dombay, Zsolt; Pinter, Zoltan; Gregar, Erzsebet, nee Toth; Dudas, Julianna, nee Sz. Kiss; Nagy, Emilia, nee Gera; and Fodor, Istvan, 4,086,339, Cl. 424-245.000.

Duncan, Ernest R. Teaching machine. 4,085,523, Cl. 35-9.00A.

Dunchock, Richard S. Storage container. 4,085,844, Cl. 206-335.000.

Dundee Cement Company: *See*—
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Dunham-Bush, Inc.: *See*—
Shaw, David N., 4,086,072, Cl. 62-2.000.

Dunlap, Thomas F.: *See*—
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Dunne, Maurice J.: *See*—
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Du Pont de Nemours, E. I., and Company: *See*—
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Jackson, Harold L.; and Mader, Frederick W., 4,085,518, Cl. 34-37.000.
Lee, Kyu Tai, 4,086,236, Cl. 260-287.0AN.

Durley, Benton A., III. Ultrasonic humidifiers, atomizers and the like. 4,085,893, Cl. 239-102.000.

Durr - Dental KG.: *See*—
Muller, Mathias, 4,086,607, Cl. 354-299.000.

Dursch, Friedrich, to E. R. Squibb & Sons, Inc. Derivatives of pleuromutilin and compositions. 4,086,359, Cl. 424-299.000.

Dynamit Nobel Aktiengesellschaft: *See*—
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Dynell Electronics Corporation: *See*—
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DiMatteo, Paul L., 4,085,472, Cl. 5-90.000.

E. R. Squibb & Sons, Inc.: *See*—
Breuer, Hermann; and Treuner, Uwe, 4,086,422, Cl. 544-21.000.
Cushman, David W.; and Ondetti, Miguel Angel, 4,086,338, Cl. 424-244.000.
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Ealing Corporation, The: *See*—
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Eash, R. Douglas: *See*—
Peters, James; VanDell, Robert D.; Eash, R. Douglas; and Lamoria, Lz F., 4,086,201, Cl. 260-29.70S.

East, George F.; and Hallum, Charles E., to Ford Motor Company. Combined warm gas fin and reaction control servo. 4,085,909, Cl. 244-3.210.

Easter, Finis Claude, to RCA Corporation. Video digital display device with analog input. 4,086,579, Cl. 340-324.0AD.

Eastman Kodak Company: *See*—
Consaul, James William; and Jadwin, Thomas Arthur, 4,085,702, Cl. 118-60.000.
Petropoulos, Constantine Chris, 4,086,210, Cl. 260-67.00R.

Ebara Manufacturing Co., Ltd.: *See*—
Saito, Shozo; and Inoue, Naoyuki, 4,085,595, Cl. 62-476.000.

Ebbeson, Bengt Ebbe Oscar: *See*—
Svensson, Sven Arne; and Ebbeson, Bengt Ebbe Oscar, 4,085,968, Cl. 297-243.000.

Eberle, William J., to General Battery Corporation. Method of casting lead alloy automotive battery parts. 4,085,792, Cl. 164-72.000.

Echterhoff, Heinrich; Simonis, Wolfgang; Rohde, Wolfgang; and Beck, Kurt-Gunther, to Bergwerksverband GmbH. Coking method and arrangement. 4,086,143, Cl. 201-41.000.

Eckstein, Werner Willi Gustav; and Schweinsberg, Dieter Klaus-Jurgen, to Eichner Organisation KG. Data carrier holder. 4,085,534, Cl. 40-124.200.

Eduard Kusters: *See*—
Ahrweiler, Klaus; Leifeld, Ferdinand; Quoos, Kurt; and Kusters, Eduard Finkenweg 18, 4,086,316, Cl. 264-120.000.

Edward Shanbrom, Inc.: *See*—
Shanbrom, Edward; and Bishop, Robert C., 4,086,218, Cl. 260-112.00B.

Edwards, Gerald L.: *See*—
Ullakko, Richard J.; and Edwards, Gerald L., 4,086,441, Cl. 179-84.00C.

Edwards, Joseph Franklin; Brown, Johnny Milton; Christian, James Vernon; and Elkins, Clayton, to General Shale Products Corporation. Pulverulent material metering and delivery system and method. 4,085,976, Cl. 302-25.000.

Edwards, Wayne L., Jr.: *See*—
Cizmic, Stipe; Edwards, Wayne L., Jr.; Jacques, James O.; Mahon, Douglas K.; and Shenfield, Leonard R., 4,086,636, Cl. 360-75.000.
Cizmic, Stipe; Edwards, Wayne L., Jr.; Griffith, David L.; Halfhill, Martin O.; Jacques, James O.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,086,659, Cl. 364-900.000.

Egee, Walter W.; and Cramer, Clarence W., to Campbell Soup Company. Cookie dispensing apparatus. 4,085,563, Cl. 53-59.00R.

Eger, Richard Thomas: *See*—
Cheshire, David Alan; Debbas, Samir Costandi; Eger, Richard Thomas; Schermacher, Ken Stephen; and Twohig, Paul Thomas, 4,086,381, Cl. 428-113.000.

Ehlen, Anton: *See*—
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Eichner Organisation KG: *See*—
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Schweinsberg, Dieter Klaus-Jurgen, 4,085,535, Cl. 40-124.200.

Eisenhauer, Rudolf: *See*—
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Ekkelboom, Tjepke Hendrik; and Geeven, Thomas, to U.S. Philips Corporation. Method of manufacturing an article containing at least one glass part in which a metal part is sealed in. 4,086,075, Cl. 65-40.000.

Eklund, Urban, to Kockums Automation AB. Method and machine for band sawing. 4,085,636, Cl. 83-56.000.

Elbatainer Kunststoff- und Verpackungs-Gesellschaft mbH: *See*—
Lampart, Dieter; and Kormendi, Kalman, 4,086,314, Cl. 264-89.000.

Eldridge, Eugene E.: *See*—
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Electric Power Research Institute, Inc.: *See*—
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Electro-Craft Corporation: *See*—
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Elgersma, Henry J. Guard monitor system. 4,086,577, Cl. 340-306.000.

Eli Lilly and Company: *See*—
Gland, Thomas M.; and Frederickson, Robert C. A., 4,085,705, Cl. 119-17.000.

Eliasson, Sonja Margareta Isabella. Crash moderation system for roads, highways, railways, airfields and harbors. 4,086,015, Cl. 404-6.000.

Elkins, Clayton: *See*—
Edwards, Joseph Franklin; Brown, Johnny Milton; Christian, James Vernon; and Elkins, Clayton, 4,085,976, Cl. 302-25.000.

Ellers, Frederick S.: *See*—
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Elpower Corporation: *See*—
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EMC Energies, Inc.: *See*—
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EMI Limited: *See*—
Lodge, James Alec· and Jarrett, John James, 4,086,492, Cl. 250-416.0TV.

Emmert, Reinhold, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig. Tape recorder control unit. 4,085,908, Cl. 242-201.000.

Endo, Hiroshi: *See*—
Toriumi, Shiro; and Endo, Hiroshi, 4,086,469, Cl. 235-92.0MP.

Enenkel, Hans-Joachim: *See*—
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Energy Development Associates: *See*—
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Energy Materials, Inc.: *See*—
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Eng, Don: *See*—
Speiser, Maxmilian Richard; Eng, Don; and Sawyer, Gerry Dun, 4,086,630, Cl. 364-410.000.

Engelberger, Joseph F.; Dunne, Maurice J.; and Perzley, William, to Unimation, Inc. Computer assisted teaching arrangement for conveyor line operation. 4,086,522, Cl. 318-568.000.

Engels, Walter; and Willbanks, Charles E., to Milliken Research Corporation. Apparatus for sculpturing pile fabrics. 4,085,700, Cl. 118-37.000.

Engle, Charles J.; and Runnels, John H., to Phillips Petroleum Company. Plugging earth strata. 4,085,800, Cl. 166-288.000.

Enso-Gutzeit Osakeyhtio: *See*—
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Environmental Research Institute of Michigan: *See*—
Currie, George Daniel, 4,085,501, Cl. 29-593.000.

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Erco Industries Limited: *See*—
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Eremin, Gennady Efimovich: *See—*
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Erge, Dieter: *See—*
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Erickson, Robert A.: *See—*
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Ericson, Harry; and Fredriksson, Carl Otto, to Nordnero AB. Solutions for chemically polishing surfaces of copper and its alloys. 4,086,176, Cl. 252-100.000.

Erwin, Curtis L., Jr. Compensated fuel measuring system for engines. 4,085,610, Cl. 73-113.000.

Espander, John C., to Honeywell Inc. Thermostat. 4,085,843, Cl. 206-328.000.

Esselborn, Reiner; and Bernhard, Horst, to Merck Patent Gesellschaft mit beschrankter Haftung. Rutile-containing lustrous pigments. 4,086,100, Cl. 106-291.000.

Eszakmagyarorszagi Vegyimuvek: *See—*
Matolcsy, Gyorgy; Bordas, Barna; Bokor, Gyorgy; Dombay, Zsolt; Pinter, Zoltan; Gregar, Erzsebet, nee Toth; Dudas, Julianna, nee Sz. Kiss; Nagy, Emilia, nee Gera; and Fodor, Istvan, 4,086,339, Cl. 424-245.000.

Etablissements Vape: *See—*
Vanotti, Guy, 4,085,652, Cl. 85-83.000.

Ethyl Corporation: *See—*
Hornbaker, Edwin D.; Nugent, Adam, Jr.; and Loechelt, Cecil P., 4,086,414, Cl. 528-500.000.

Etoh, Jun: *See—*
Yoshida, Isao; Hori, Ryoichi; Masuda, Hiroo; Minato, Osamu; Etoh, Jun; and Nakai, Masaaki, 4,086,642, Cl. 361-91.000.

Etoh, Motoaki, to Fuji Jukogyo Kabushiki Kaisha. Fuel supply system for multi-fuel internal combustion engines. 4,085,720, Cl. 123-127.000.

Ettridge, John P. Orbital machine with cooperating lobe and recess guide means. 4,086,039, Cl. 418-61.00R.

Evans, Anthony G.: *See—*
Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., 4,086,272, Cl. 260-559.00D.

Evans, Frances Mae, executrix: *See—*
Evans, John, Jr., deceased, 4,086,513, Cl. 313-414.000.

Evans, John, Jr., deceased (by Evans, Frances Mae, executrix), to RCA Corporation. Plural gun cathode ray tube having parallel plates adjacent grid apertures. 4,086,513, Cl. 313-414.000.

Evans Products Company: *See—*
Stone, Thomas G., 4,085,685, Cl. 105-498.000.

Evans, Virginia Sunner. Combined animal weaning, watering and feeding dishes. 4,085,706, Cl. 119-61.000.

Evenson, Gerald N., to Upjohn Company, The. 1,5-Dihydro-7-aryl-astriazine[4,3,-α][1,4]benzodiazepin-1-ols. 4,086,230, Cl. 260-243.300.

Everett, William Clinton. Ultrasonic disinfection system. 4,086,057, Cl. 21-54.00A.

Ewald, Alfred. Device for producing aesthetic effects. 4,085,533, Cl. 40-406.000.

Ex-Cell-O Corporation: *See—*
Lisiecki, Robert E.; Crawford, Duncan J.; and Wise, Daniel J., 4,085,885, Cl. 229-17.00R.

Exxon Production Research Company: *See—*
Butler, Roger Moore, 4,085,803, Cl. 166-303.000.

Exxon Research & Engineering Co.: *See—*
Cahn, Robert P.; and Li, Norman N., 4,086,163, Cl. 210-22.00D.
Dickakian, Ghazi Mourad, 4,086,156, Cl. 204-294.000.
Henry, H. Clarke; and Ranganathan, Ramaswami, 4,086,184, Cl. 252-414.000.
Moss, Gerald, 4,085,707, Cl. 122-4.00D.
Vardi, Joseph; and Kittler, Milton J., 4,085,721, Cl. 123-136.000.
Whittingham, M. Stanley; and Newman, Gerald H., 4,086,403, Cl. 429-194.000.

Ezell, George D.; Murphy, Marvin L., Jr.; and Davis, Paul D., Jr., to Texas Instruments Incorporated. Distributed data acquisition. 4,086,504, Cl. 340-15.5TS.

Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, to Toray Industries, Inc. Dry planographic printing plate. 4,086,093, Cl. 96-86.00P.

Facet Enterprises, Inc.: *See—*
Wilkinson, John Robert, 4,086,518, Cl. 318-127.000.

Fahrbach, Gerhard; Gerberding, Karl; Seiler, Erhard; and Stein, Dieter, to BASF Aktiengesellschaft. Branched block copolymers and their manufacture. 4,086,298, Cl. 260-880.00B.

Fairchild Camera and Instrument Corporation: *See—*
Chung, David H., 4,086,626, Cl. 364-200.000.

Faivre, Christian: *See—*
Buhler, Roger; and Faivre, Christian, 4,086,521, Cl. 318-307.000.

Fancher, Llewellyn W., to Stauffer Chemical Company. Thiazole bis-phosphates and phosphonates, intermediates, and insecticidal compositions and methods. 4,086,239, Cl. 260-306.80R.

Fantino, Jean: *See—*
Prudhon, Francois; Fantino, Jean; and Mounier, Francois, 4,086,099, Cl. 106-109.000.

Farfaglia, Silvio T., to Phillips Petroleum Company. Universal mandrel for container forming apparatus. 4,085,664, Cl. 93-44.10R.

Farha, Floyd E., Jr.: *See—*
Cichowski, Robert S.; and Farha, Floyd E., Jr., 4,086,290, Cl. 260-680.00E.

Farwell, Paul E. Dolly apparatus. 4,085,953, Cl. 254-10.00C.

Fechillas, Michael R.: *See—*
Ness, Irving Stanley; and Fechillas, Michael R., 4,085,754, Cl. 128-287.000.

Federhen, Ernst: *See—*
Weisgerber, Willi; and Federhen, Ernst, 4,085,930, Cl. 271-204.000.

Fekl, Werner, to J. Pfrimmer & Co. Graduated container. 4,085,866, Cl. 222-158.000.

Felten & Guilleaume Carlswerk AG: *See—*
Brakelmann, Heinrich, 4,086,425, Cl. 174-15.00C.

Felter, John V. Turbine ventilators and method of manufacture. 4,086,028, Cl. 416-227.00A.

Ferranti Limited: *See—*
Pitches, Brian Edward; and Murray, Robert Malcolm Stuart, 4,086,569, Cl. 340-167.00R.

Ferro Corporation: *See—*
Hummel, Floyd A.; and Sombuthawee, Charussri, 4,086,123, Cl. 106-293.000.

Feuillade, Georges, to Compagnie Generale d'Electricite S.A. Lithium electric cell. 4,086,402, Cl. 429-190.000.

Fifer, James T. Apparatus for cutting lumber to variable clear lengths. 4,085,638, Cl. 83-71.000.

Fillmore, Gary L.; Hill, James D.; Robinson, William F.; and Williams, Thomas H., to International Business Machines Corporation. Sequential ink jet printing system with variable number of guard drops. 4,086,601, Cl. 346-75.000.

Filtrol Corporation: *See—*
Lim, John; and Stamires, Dennis, 4,086,187, Cl. 252-455.00Z.

Finelli, Patrick L.; and Paglia, Richard, to Polaroid Corporation. Strobe camera with flat capacitor. 4,086,606, Cl. 354-288.000.

Finlay, David Ernest, to International Business Machines Corporation. Input/output and diagnostic arrangements for programmable machine controllers having multiprogramming capabilities. 4,086,658, Cl. 364-900.000.

Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., to Owens-Corning Fiberglas Corporation. Apparatus for packing compressible fibrous batts. 4,085,562, Cl. 53-59.00R.

Firestone, Raymond A.; Ratcliffe, Ronald W.; and Christensen, Burton G., to Merck & Co., Inc. Process for cephem synthesis. 4,086,423, Cl. 544-21.000.

Firestone Tire & Rubber Company, The: *See—*
Claxton, William Eugene, 4,086,564, Cl. 340-58.000.
Johnsen, John Arthur, 4,086,047, Cl. 425-450.100.

Fischer, Don G.; and Holland, Harold, to Square D Company. Padlock adapter assembly. 4,085,599, Cl. 70-14.000.

Fischer, Wolfgang: *See—*
Weisshappel, Helmut; Klie, Wolfgang; and Fischer, Wolfgang, 4,085,956, Cl. 293-86.000.

Fish, Herbert L. Impact tool and handle assembly therefor. 4,085,784, Cl. 145-29.00R.

Fisher, Howard M.; and Montgomery, Harry T., to Pennsylvania Engineering Corporation. Cooling assembly for metallurgical vessels. 4,085,924, Cl. 266-241.000.

Flottweg-Werk Dr. Georg Bruckmayer GmbH & Co. KG: *See—*
Jager, Ernst Adolf, 4,085,888, Cl. 233-7.000.

Flynn, Jean Louis. Hinge security stud. 4,085,650, Cl. 85-41.000.

FMC Corporation: *See—*
Mughannam, Adil A., 4,085,668, Cl. 99-483.000.

Focke, Heinz, to Focke & Pfuhl. Method and apparatus for making tray-type packets. 4,085,564, Cl. 53-32.000.

Focke, Heinz; and Liedtke, Kurt, to Focke & Pfuhl. Foldable blanks for making packets for rod-shaped articles. 4,085,568, Cl. 53-234.000.

Focke & Pfuhl: *See—*
Focke, Heinz, 4,085,564, Cl. 53-32.000.
Focke, Heinz; and Liedtke, Kurt, 4,085,568, Cl. 53-234.000.

Fodor, Istvan: *See—*
Matolcsy, Gyorgy; Bordas, Barna; Bokor, Gyorgy; Dombay, Zsolt; Pinter, Zoltan; Gregar, Erzsebet, nee Toth; Dudas, Julianna, nee Sz. Kiss; Nagy, Emilia, nee Gera; and Fodor, Istvan, 4,086,339, Cl. 424-245.000.

Foerst, Paul W.: *See—*
Knox, Walter R.; Hill, James C.; Hughes, Lawrence J.; and Foerst, Paul W., 4,086,195, Cl. 260-2.50N.

Fogarollo, Pier Paolo, to LAMES Societa per Azioni. Electric window regulator for motor vehicles with means for manual emergency operation. 4,085,629, Cl. 74-625.000.

Foo, Kenneth, to Gottlieb, Theodore. Sling for tennis racket. 4,085,872, Cl. 224-5.00D.

Ford Motor Company: *See—*
East, George F.; and Hallum, Charles E., 4,085,909, Cl. 244-3.210.
Hamburg, Douglas R.; and Giardini, Dante S., 4,085,719, Cl. 123-122.00E.
Reams, Lowell A.; and Dunlap, Thomas F., 4,085,588, Cl. 60-517.000.

Foreman, Donald S., to Honeywell Inc. Gated pulse generator. 4,086,538, Cl. 328-112.000.

Formenti, Augusto. Liquid-treatment system. 4,086,165, Cl. 210-104.000.

Foster Wheeler Energy Corporation: *See—*
Ashdown, Ronald Arthur, 4,085,708, Cl. 122-7.00B.

Fox, David A.; and Apfelbeck, Otto L., to Westinghouse Electric Corporation. Control circuit initiating conduction of an opto-isolator unit. 4,086,503, Cl. 307-363.000.

Foxall, Thomas George; Ibrahim, Abd-El-Fattah Ali; and Sellars, Lester Porter, to Northern Telecom Limited. Double split-electrode for charge transfer device. 4,086,609, Cl. 357-24.000.

Foxboro Company, The: *See*—
Curran, John R.; Sgourakes, George E.; and Richardson, David A., 4,085,614, Cl. 73-194.0VS.

Fozzard, George B., to Phillips Petroleum Company. Fluoro compound preparation. 4,086,407, Cl. 526-75.000.

Fraley, Phillip Edward, to Bell Telephone Laboratories Incorporated. Current to voltage converter. 4,086,624, Cl. 363-127.000.

Frank, Robert I.: *See*—
Kaplow, Roy; and Frank, Robert I., 4,086,485, Cl. 250-203.00R.

Franklin, Dwaine R. Deck platform extension for boats. 4,085,473, Cl. 9-1.700.

Franks, Lawrence A.; and Eldridge, Eugene E., to Burr Oak Tool & Gauge Company. Return elbow and crossover bender. 4,085,608, Cl. 72-297.000.

Franssen, Nico Valentinus; Kuijk, Karel Elbert; and Siebelink, Johannes Willem, to U.S. Philips Corporation. Compression system. 4,086,431, Cl. 179-1.0SA.

Frazier, Stephen E., to Rush-Hampton Industries. Animal litter. 4,085,704, Cl. 119-1.000.

Frederickson, Robert C. A.: *See*—
Gland, Thomas M.; and Frederickson, Robert C. A., 4,085,705, Cl. 119-17.000.

Fredriksson, Carl Otto: *See*—
Ericson, Harry; and Fredriksson, Carl Otto, 4,086,176, Cl. 252-100.000.

Freedman Seating Company, The: *See*—
Wahls, Robert A., 4,085,962, Cl. 296-65.00R.

Freeman, Christopher; and Moritz, Robert Rudolph, to Rolls-Royce Limited. Gas turbine engine with improved compressor casing for permitting higher air flow and pressure ratios before surge. 4,086,022, Cl. 415-119.000.

Freeman, Stephen Morrison: *See*—
Busch, John Folts; and Freeman, Stephen Morrison, 4,086,067, Cl. 51-296.000.

Freeman, Vernon L.: *See*—
Kam, Clifford Y.; Freeman, Vernon L.; and Penton, Allen P., 4,086,378, Cl. 428-36.000.

Frese, Albert: *See*—
Zerpner, Dieter; Nedden, Klaus Zur; Frese, Albert; and Datene, Hans, 4,086,301, Cl. 260-897.00A.

Freund Precision, Inc.: *See*—
Freund, Robert F.; and Sturgeon, Wayne, 4,086,483, Cl. 362-311.000.

Freund, Robert F.; and Sturgeon, Wayne, to Freund Precision, Inc. Device for installing within a panel opening for supporting an electrical component or the like. 4,086,483, Cl. 362-311.000.

Fricke, Jobst; and Geiseler, Wolfgang, to CMB Colonia Management- und Beratungsgesellschaft mbH & Co. K.G. Electronic sound synthesis. 4,085,648, Cl. 84-1.240.

Friebe, Walter-Gunar; Thiel, Max; Stach, Kurt, deceased; by Plattner, Werner, administrator; Wilhelms, Otto-Henning; von Mullendorff, Erika; and Sponer, Gisbert, to Boehringer Mannheim GmbH. 9[3-(4-Phenoxymethylpiperidino)-propyl]-adenines. 4,086,347, Cl. 424-253.000.

Fried, Raymond L., to John Fluke Mfg. Co., Inc. Frequency synthesizer using phase locked loops. 4,086,544, Cl. 331-1.00A.

Frommlet, Hubert: *See*—
Weiland, Emil; Schwarz, Alois; Mautz, Karl-Heinz; and Frommlet, Hubert, 4,086,024, Cl. 416-140.000.

Fruehauf Corporation: *See*—
Ringe, Stephen J., 4,085,966, Cl. 296-146.000.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Etoh, Motoaki, 4,085,720, Cl. 123-127.000.

Fuji Photo Film Co., Ltd.: *See*—
Asao, Yasuzi; and Ogata, Yasuhiro, 4,085,949, Cl. 282-27.500.
Shiba, Keisuke; Hirose, Takeshi; Inouye, Kozo; and Okumura, Akio, 4,086,094, Cl. 96-100.00R.
Suzuki, Masaaki; Shirahata, Ryuji; Aonuma, Masashi; and Kitamoto, Tatsuji, 4,086,374, Cl. 427-48.000.
Suzuki, Osamu; Oishi, Kengo; Akashi, Goro; and Sega, Kenji, 4,085,907, Cl. 242-199.000.

Fujikawa, Kaoru: *See*—
Osujyo, Masahide; Yamanishi, Isamu; Inamori, Akio; Fujikawa, Kaoru; Wakabayashi, Noboru; Ikegami, Seiichi; Okada, Makoto; and Katayama, Morimitsu, 4,085,806, Cl. 172-9.000.

Fujikura, Yoshiaki: *See*—
Inamoto, Yoshiaki; Tsuchihashi, Kiyoshi; Takaishi, Naotake; Fujikura, Yoshiaki; and Aigami, Koji, 4,086,285, Cl. 260-666.0PY.

Fujita, Masayuki: *See*—
Kubo, Sueki; Toso, Katsuya; and Fujita, Masayuki, 4,085,894, Cl. 239-121.000.

Fujitsu Limited: *See*—
Matsuyama, Shunsuke; Tanahashi, Junichi; Imamura, Kenso; and Majima, Teiji, 4,086,661, Cl. 365-39.000.

Fujiwara, Shinji: *See*—
Shibata, Toshiji; and Fujiwara, Shinji, 4,086,535, Cl. 325-128.000.

Fujiwara, Yasuo: *See*—
Kojima, Ichiro; Sato, Hiroshi; and Fujiwara, Yasuo, 4,086,138, Cl. 195-65.000.

Fulp, William W.; Nance, Jack G.; Owens, James L.; and Robbins, Theodore W., to Western Electric Company, Inc. Universal attenuator. 4,086,546, Cl. 333-81.00R.

Furubayashi, Ei-ichi: *See*—
Masumoto, Katashi; Furubayashi, Ei-ichi; and Inoue, Wahei, 4,086,508, Cl. 310-86.000.

Furukawa, Wataru: *See*—
Yoshida, Mitsuo; Furukawa, Wataru; Yamaguchi, Takashi; and Sasaki, Kazuo, 4,085,942, Cl. 277-30.000.

Furuto, Takashi, to Kabushiki Kaisha Komatsu Seisakusho. Apparatus for shearing wire, rod, or the like. 4,085,640, Cl. 83-198.000.

G. D. Searle & Co.: *See*—
Adelstein, Gilbert W.; Dajani, Esam Z.; and Yen, Chung Hwai, 4,086,227, Cl. 260-239.00B.
Dryden, Hugh Latimer, Jr.; and Erickson, Robert A., 4,086,234, Cl. 260-268.0BC.
Jiu, James; and Mizuba, Seth S., 4,086,268, Cl. 560-252.000.
Schlatter, James M., 4,086,220, Cl. 260-112.50R.

G. D. Societa per Azioni: *See*—
Seragnoli, Enzo, 4,085,569, Cl. 53-389.000.
Seragnoli, Enzo, 4,085,759, Cl. 131-25.000.

G. Siempelkamp & Co.: *See*—
Axer, Heinrich; and Roth, Gerd, 4,086,313, Cl. 264-70.000.

Gaasenbeek, Johannes Leonardus. All-terrain vehicle. 4,085,697, Cl. 115-1.00R.

Gadessaud, Robert, to Compagnie Generale d'Electricite S.A. Battery containing an alkaline electrolyte. 4,086,405, Cl. 429-253.000.

GAF Corporation: *See*—
Schneider, Louis; and Graham, David E., 4,086,356, Cl. 424-274.000.
Schneider, Louis; and Graham, David E., 4,086,364, Cl. 424-340.000.

Gaines, Donald Raymond; and Jelenic, Bronco Felex, deceased (by Jelenic, Ronald B., administrator), to Gulf & Western Manufacturing Company. Multi-chambered foam energy absorber. 4,085,832, Cl. 188-268.000.

Gallo, Charles F., Jr.; Hammond, Thomas J.; and Rees, James D., to Xerox Corporation. Illumination system utilizing two opposing DC lamps with an optimum barrel-shaped slit. 4,086,010, Cl. 355-70.000.

Gamble, Dennis H., to Westinghouse Electric Corporation. Bus duct plug-in ground stab. 4,085,988, Cl. 339-14.00R.

Garasi, Louis A.; and Hayes, Ronald F., to Gruber Systems, Inc. Molding process for a plastic-coated ceramic decorative plumbing fixture. 4,086,318, Cl. 264-135.000.

Garcea, Giampaolo, to Alfa Romeo S.p.A. Vertical-flow catalytic muffler. 4,086,063, Cl. 23-288.00F.

Garlinghouse, Leslie H.: *See*—
Garlinghouse, Ronald E., 4,085,587, Cl. 60-403.000.

Garlinghouse, Ronald E., to Garlinghouse, Leslie H. Fail safe liquid power device. 4,085,587, Cl. 60-403.000.

Garnier, Pierre Georges; Gaullier, Bruno; and Jeanroy, Gerard Michel, to Auvitec. Process for repeating control of working operations of several machines. 4,086,625, Cl. 364-104.000.

Garzia, Aldo; and Williams, Robert D., to Istituto Chemioterapico Italiano. Product and method for combatting swine dysentery. 4,086,345, Cl. 424-251.000.

Gaskill, James R., Jr.; and Weill, Lawrence R., to United States of America, Air Force. Five-stage four-bit complex multiplier. 4,086,657, Cl. 364-757.000.

Gates, Albert George Ronald; and Maynard, Michael, to Gestetner Limited. Torque limiting used screen take-up assembly and drive. 4,085,671, Cl. 101-128.100.

Gaudette, Robert. Flue liner handling device. 4,085,958, Cl. 294-97.000.

Gaullier, Bruno: *See*—
Garnier, Pierre Georges; Gaullier, Bruno; and Jeanroy, Gerard Michel, 4,086,625, Cl. 364-104.000.

Gauss, Robert C.; Sathe, Hemant T.; and Wills, Lynn D., to Motorola, Inc. Whip antenna assembly and method of manufacture. 4,086,596, Cl. 343-715.000.

Gavin, John J., to General Electric Company. Dynamoelectric machine mounting assembly. 4,085,914, Cl. 248-19.000.

Gaworowski, Andrew J.; and Duckett, John C., to Dayco Corporation. Smash-recoverable printing blanket. 4,086,386, Cl. 428-307.000.

Gay, Sandy C.: *See*—
Robandt, William F.; Cartier, Roger J.; and Gay, Sandy C., 4,086,553, Cl. 336-192.000.

GB Fermentation Industries Inc.: *See*—
Hoerle, Raymond D., 4,086,139, Cl. 195-66.00R.

Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H.: *See*—
Lanfermann, Willy; Henrich, Friedhelm; and Oberste-Beulmann, Klaus, 4,085,974, Cl. 299-53.000.

Geeven, Thomas: *See*—
Ekkelboom, Tjepke Hendrik; and Geeven, Thomas, 4,086,075, Cl. 65-40.000.

Geiseler, Wolfgang: *See*—
Fricke, Jobst; and Geiseler, Wolfgang, 4,085,648, Cl. 84-1.240.

Gellert, Dale Albert, to Procter & Gamble Company, The. Disposable diaper with integral disposal bag. 4,085,753, Cl. 128-284.000.

General Atomic Company: *See*—
Anderson, Paul Michael, 4,086,133, Cl. 176-30.000.

General Battery Corporation: *See*—
Eberle, William J., 4,085,792, Cl. 164-72.000.
Heiser, Joseph Irvin; and Erb, Edgar Martin, 4,086,395, Cl. 429-88.000.

General Dynamics Corporation: *See*—
Krikorian, Esther; and Crisp, Michael J., 4,086,555, Cl. 338-15.000.

General Electric Company: *See*—
Cella, James A., 4,086,091, Cl. 96-36.200.
Gavin, John J., 4,085,914, Cl. 248-19.000.

Gillette, Stephen F., 4,086,460, Cl. 200-146.00R.
Haefner, Kenneth B.; and Ringwall, Carl G., 4,085,615, Cl. 73-194.00B.
Huseby, Irvin C.; and Klug, Frederic J., 4,086,311, Cl. 264-43.000.
Ibsen, Ole N.; and Anderson, Thomas E., 4,086,525, Cl. 320-33.000.
Kydd, Paul H., 4,085,578, Cl. 60-39.020.
Rich, Joseph A., 4,086,459, Cl. 200-144.00B.
Sommer, Edward G., Jr., 4,086,053, Cl. 432-222.000.
Tassie, Douglas Pray; and Pustell, Robert A., 4,085,653, Cl. 89-7.000.
Ziemba, Richard Thomas, 4,085,680, Cl. 102-70.20R.

General Medical Appliance Research Corporation: *See—*
Hill, James J., 4,086,488, Cl. 250-231.00P.

General Shale Products Corporation: *See—*
Edwards, Joseph Franklin; Brown, Johnny Milton; Christian, James Vernon; and Elkins, Clayton, 4,085,976, Cl. 302-25.000.

Genevieve I. Hanscom, Robert M. Magnuson & Lois J. Thomson, Trustees of the Estate of Roy M. Magnuson: *See—*
Crawford, Lynn D., 4,085,839, Cl. 198-410.000.

George, Clifford L.: *See—*
Smith, Craig A.; and George, Clifford L., 4,086,007, Cl. 355-3.00R.

Gerberding, Karl: *See—*
Fahrbach, Gerhard; Gerberding, Karl; Seiler, Erhard; and Stein, Dieter, 4,086,298, Cl. 260-880.00B.

Gernes, David B., to Thermo Electron Corporation. Pneumatic pump monitor. 4,086,653, Cl. 364-564.000.

Gerry Wind Assoc. Color Labs.: *See—*
Gewirtz, William, 4,086,009, Cl. 355-30.000.

Gerstenmeier, Jurgen: *See—*
Leiber, Heinz; Gerstenmeier, Jurgen; and Klotz, Hermann, 4,085,979, Cl. 303-92.000.

Gerzon, Michael Anthony, to National Research Development Corporation. Sound reproduction system with non-square loudspeaker lay-out. 4,086,433, Cl. 179-1.0GQ.

Gestetner Limited: *See—*
Gates, Albert George Ronald; and Maynard, Michael, 4,085,671, Cl. 101-128.100.

Gewirtz, William, to Gerry Wind Assoc. Color Labs. Photographic enlarging equipment and method. 4,086,009, Cl. 355-30.000.

Ghosh, Sambhunath; and Klass, Donald L., to Institute of Gas Technology. Situ mining of fossil fuel containing inorganic matrices. 4,085,972, Cl. 299-7.000.

Giardini, Dante S.: *See—*
Hamburg, Douglas R.; and Giardini, Dante S., 4,085,719, Cl. 123-122.00E.

Gibbs, James Whitman, to Gibbs-Ryder Materials Handling Systems, Inc. Reverse flow valve for pneumatic systems. 4,085,767, Cl. 137-102.000.

Gibbs, Norman S. Solar heaters. 4,085,734, Cl. 126-271.000.

Gibbs-Ryder Materials Handling Systems, Inc.: *See—*
Gibbs, James Whitman, 4,085,767, Cl. 137-102.000.

Giggins, Charles Stanley, Jr.; and Kear, Bernard Henry, to United Technologies Corporation. Alumina forming coatings containing hafnium for high temperature applications. 4,086,391, Cl. 428-679.000.

Gill, George Herbert. Method for using geothermal energy. 4,085,795, Cl. 165-45.000.

Gillette, Stephen F., to General Electric Company. Circuit breaker having improved line strap construction. 4,086,460, Cl. 200-146.00R.

Gillpatrick, Sherman R. Air circulating heater for fireplaces. 4,085,727, Cl. 126-121.000.

Giordano, John A.: *See—*
Mahaffy, Reid A.; Psota, Joseph M.; and Giordano, John A., 4,085,565, Cl. 53-112.00A.

Girling Limited: *See—*
Bottoms, Harry Simister; and Archer, John Richard, 4,085,830, Cl. 188-196.00D.

Gisbrecht, James H.: *See—*
Baker, William G.; Gisbrecht, James H.; and Luszcz, Edward T., 4,085,910, Cl. 244-3.160.

GKN Transmissions Limited: *See—*
Bailey, Richard John, 4,085,835, Cl. 192-113.0AB.

Glacier Metal Company Limited, The: *See—*
Davies, Glyndwr John, 4,086,376, Cl. 427-185.000.
Michael, Anthony Dennis; White, John Albert; and Griffin, Gerald Louis, 4,086,083, Cl. 75-64.000.

Gland, Thomas M.; and Frederickson, Robert C. A., to Eli Lilly and Company. Animal cage. 4,085,705, Cl. 119-17.000.

Glaspie, Donald L., to Glitsch, Inc. Tower packing saddle. 4,086,307, Cl. 261-97.000.

Glasrock Products, Inc.: *See—*
Midorikawa, Yoshio, 4,086,312, Cl. 264-46.600.

Glitsch, Inc.: *See—*
Glaspie, Donald L., 4,086,307, Cl. 261-97.000.

Globe Tool and Engineering Company, The: *See—*
Pearsall, Harold I., 4,086,117, Cl. 156-212.000.

Glory Kogyo Kabushiki Kaisha: *See—*
Nobuhiro, Iizuka, 4,085,879, Cl. 225-93.000.

Glowacki, Frank J. Painting shield. 4,085,703, Cl. 118-504.000.

Goebel, Franz; and Marincic, Nikola, to GTE Laboratories Incorporated. Electrochemical cell and cathode for same. 4,086,397, Cl. 429-105.000.

Goebel, Rolf-Dieter: *See—*
Jacubasch, Dieter; Eisenhauer, Rudolf; Greifenberg, Juergen; and Goebel, Rolf-Dieter, 4,085,898, Cl. 241-175.000.

Goeke, Alfons, to Th. Kieserling & Albrecht. Cutting tool. 4,086,016, Cl. 407-114.000.

Goggins, William B., Jr., to United States of America, Air Force. Method and apparatus for improving the slowly moving target detection capability of an AMTI synthetic aperture radar. 4,086,590, Cl. 343-5.0CM.

Golda, Eugene; and Wilkes, Alan Leonard, to Polychrome Corporation. Process for making photosensitive lithographic printing plates involving sequentially coating with potassium zirconium fluoride and sodium silicate. 4,086,092, Cl. 96-86.00R.

Golden, Gerald S.: *See—*
Brooks, Clyde S.; Lemkey, Franklin D.; and Golden, Gerald S., 4,086,264, Cl. 252-454.000.

Goldstein, Sidney: *See—*
Scrivo, Leonard; and Goldstein, Sidney, 4,086,004, Cl. 351-158.000.

Golias, Tipton L.; and Mayes, David G., to Helena Laboratories Corporation. Method for applying an organic liquid sample. 4,086,372, Cl. 427-2.000.

Gonda, Shunichi, to Agency of Industrial Science & Technology. Selective doping crystal growth method. 4,086,108, Cl. 148-175.000.

Gonek, Stanislaw Mieczyslaw, to Reyrolle Parsons Limited. High-voltage circuit-interrupters. 4,086,461, Cl. 200-148.00R.

Goodfellow, John William; O'Connor, John Joseph; and Shrive, Nigel Graham, to National Research Development Corporation. Prosthetic joint device. 4,085,466, Cl. 3-1.910.

Goodman, Jack: *See—*
Adelman, Herbert B.; and Goodman, Jack, 4,086,384, Cl. 428-213.000.

Goodyear Tire & Rubber Company, The: *See—*
Caravito, Vito A., 4,085,786, Cl. 152-158.000.

Gordon, Roger G., to Safe Rack, Inc. Newspaper vending machine. 4,085,864, Cl. 221-155.000.

Gorham, Michael L.; and Norian, Roger F., to Xerox Corporation. Automatic dialer with a programmable pause. 4,086,443, Cl. 179-90.0BD.

Gorman, Joseph G.; Hicks, John M.; and Holmes, Francis Alan, to Electric Power Research Institute, Inc. Repulsion coil actuator for high speed high power circuits. 4,086,645, Cl. 361-155.000.

Goswami, Jagadish C.: *See—*
Altscher, Siegfried; and Goswami, Jagadish C., 4,086,194, Cl. 260-2.5AJ.

Goto, Susumu: *See—*
Mori, Taketoshi; Goto, Susumu; Katsuragi, Asaichi; and Matsuki, Mutsuo, 4,086,295, Cl. 260-857.00L.

Gotoh, Akio: *See—*
Asakawa, Shigeru; Sugiyama, Fumio; Gotoh, Akio; and Okamoto, Shigenori, 4,086,537, Cl. 325-478.000.

Gottlieb, Theodore: *See—*
Foo, Kenneth, 4,085,872, Cl. 224-5.00D.

Gould Godart B.V.: *See—*
Rotgans, Gerrit Jacob, 4,085,741, Cl. 128-2.080.

Gould Inc.: *See—*
Mao, George W.; and Rao, Purushothama, 4,086,392, Cl. 429-50.000.

Gozzo, Franco; Rondanelli, Alfredo; and Rossi, Giorgio, to Montedison S.p.A. Process for the synthesis of thiolcarbamates. 4,086,226, Cl. 260-239.0BF.

Graber, Joseph V. Automobile bicycle carrier. 4,085,874, Cl. 224-29.00R.

Graham, David E.: *See—*
Schneider, Louis; and Graham, David E., 4,086,356, Cl. 424-274.000.
Schneider, Louis; and Graham, David E., 4,086,364, Cl. 424-340.000.

Graham, Robert, to Newalls Insulation Company Limited. Apparatus for manufacture of insulation products. 4,085,548, Cl. 51-103.0WH.

Graham, Robert, to Newalls Insulation Company Limited. Apparatus for abrasively treating insulation products. 4,085,550, Cl. 51-145.00T.

Grant, John L., to Texas Instruments Incorporated. Electronic heater for high voltage applications. 4,086,467, Cl. 219-544.000.

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Muller, Hans, 4,085,927, Cl. 270-54.000.

Graphic Arts Packaging Corporation: *See—*
Matsuyama, Glen, 4,085,841, Cl. 206-45.150.

Graupe, Daniel; and Causey, G. Donald, to Biosystems Research Group II. Method of and means for scrambling and descrambling speech at audio frequencies. 4,086,435, Cl. 179-1.50R.

Grawert, Werner: *See—*
Borowski, Eva; Braun, Klaus; Breu[illegible] Klaus; Dauth, Christoph; Erge, Dieter; Grawert, Werner; G[illegible]oger, Detlev; Hohne, Liselotte; Knothe, Edda; Muller, Monika; Nordmann, Gisela; Schirutschke, Rudolf; and Volzke, Klaus-Dieter, 4,086,141, Cl. 195-81.000.

Gray, John Patrick: *See—*
Conca, Romeo John; Gray, John Patrick; and Sloan, Tod Hunter, 4,086,129, Cl. 162-49.000.

Grayson, Martin: *See—*
Suen, Tzeng Jiueq; Begala, Arthur James, Jr.; and Grayson, Martin, 4,086,181, Cl. 252-180.000.

Great Lakes Carbon Corporation: *See—*
Juel, Leslie Harrisville; Joo', Louis Arpad; and Tucker, Kenneth Wayne, 4,086,380, Cl. 428-65.000.

Greenlaw, Robert K.: *See—*
Lewis, David Warren; and Greenlaw, Robert K., 4,085,744, Cl. 128-69.000.

Gregar, Erzsebet, nee Toth: *See—*
Matolcsy, Gyorgy; Bordas, Barna; Bokor, Gyorgy; Dombay, Zsolt; Pinter, Zoltan; Gregar, Erzsebet, nee Toth; Dudas, Julianna, nee Sz. Kiss; Nagy, Emilia, nee Gera; and Fodor, Istvan, 4,086,339, Cl. 424-245.000.

Greifenberg, Juergen: *See—*
Jacubasch, Dieter; Eisenhauer, Rudolf; Greifenberg, Juergen; and Goebel, Rolf-Dieter, 4,085,898, Cl. 241-175.000.

Griffin, Gerald Louis: *See—*
Michael, Anthony Dennis; White, John Albert; and Griffin, Gerald Louis, 4,086,083, Cl. 75-64.000.

Griffith, David L.: *See—*
Cizmic, Stipe; Edwards, Wayne L., Jr.; Griffith, David L.; Halfhill, Martin O.; Jacques, James O.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,086,659, Cl. 364-900.000.

Griffith, Glen, to Nippon Gakki Seizo Kabushiki Kaisha. Truncated decay system. 4,085,643, Cl. 84-1.010.

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Borowski, Eva; Braun, Klaus; Breuel, Klaus; Dauth, Christoph; Erge, Dieter; Grawert, Werner; Groger, Detlev; Hohne, Liselotte; Knothe, Edda; Muller, Monika; Nordmann, Gisela; Schirutschke, Rudolf; and Volzke, Klaus-Dieter, 4,086,141, Cl. 195-81.000.

Gronwick, Jerry P.: *See—*
Beck, William P.; Carr, Francis L.; and Gronwick, Jerry P., 4,085,503, Cl. 30-34.100.

Grosart, John. Inking device. 4,085,672, Cl. 101-169.000.

Groupement pour les Activites Atomiques et Avancees "GAAA" S.A.: *See—*
Carbonnel, Henri, 4,086,097, Cl. 106-64.000.

Grozdanov, Petko Kostadinov: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Punchev, Simeon Georgiev; and Petrov, Peter Dimitrov, 4,085,880, Cl. 226-90.000.

Gruber Systems, Inc.: *See—*
Garasi, Louis A.; and Hayes, Ronald F., 4,086,318, Cl. 264-135.000.

Grudelbach, Hans-Dieter, to Poul Hahn Evers. Method of and a power switching device for regulating the electrical power delivered to a consumer in an A.C. network. 4,086,526, Cl. 323-34.000.

Grulich, Heinz; and Otte, Ernst, to Bergwerksverband GmbH. Process and apparatus for the separation of float tars in the tar separator of a coking installation. 4,086,144, Cl. 201-41.000.

Grumman Aerospace Corporation: *See—*
Cartmell, Donald K.; and Witzke, Horst, 4,086,398, Cl. 429-111.000.
Nahodyl, Richard J., 4,085,911, Cl. 244-12.400.

Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
Emmert, Reinhold, 4,085,908, Cl. 242-201.000.

Grunewald, Ernst, to Hobart Corporation. Drain filter for a dishwashing machine. 4,085,761, Cl. 134-104.000.

Grunzweig & Hartmann und Glasfaser AG: *See—*
Wittmoser, Adalbert, 4,085,790, Cl. 164-7.000.

Gryctko, Carl E.; Michetti, Anthony B.; and McGinnis, Peter J., to I-T-E Imperial Corporation. Electrical operator for circuit breakers. 4,085,622, Cl. 74-53.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Lender, Adam, 4,086,566, Cl. 340-146.1AB.
Lender, Adam, 4,086,587, Cl. 340-347.0DD.

GTE Laboratories Incorporated: *See—*
Goebel, Franz; and Marincic, Nikola, 4,086,397, Cl. 429-105.000.

GTE Sylvania, Incorporated: *See—*
Jayne, Max Leroy, 4,085,990, Cl. 339-74.00R.

Gulf Research & Development Company: *See—*
Doyle, William C., Jr., 4,086,077, Cl. 71-90.000.
McIlvried, Howard G.; and Montagna, Angelo A., 4,086,158, Cl. 208-264.000.
Onopchenko, Anatoli; and Schulz, Johann G., 4,086,277, Cl. 260-591.000.

Gulf & Western Manufacturing Company: *See—*
Gaines, Donald Raymond; and Jelenic, Bronco Felex, deceased, 4,085,832, Cl. 188-268.000.

Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, to Politechnika Lodzka; and Zaklady Mechaniczne im. Gen. Karola Swierczewskiego "Zamech". Shrouded rotor blade annulus for a centripetal turbine stage. 4,086,027, Cl. 416-184.000.

Gunyou, Lyman J.: *See—*
Joray, Marvin L.; Heckley, Warner M.; and Gunyou, Lyman J., 4,085,570, Cl. 56-2.000.

Gurgiolo, Arthur Emilio: *See—*
Baxter, Clyde Edward; and Gurgiolo, Arthur Emilio, 4,086,159, Cl. 208-333.000.

Gustafson, Donald E.; and Speyer, Jason L., to Massachusetts Institute of Technology. First-order phase-lock loop. 4,086,539, Cl. 328-155.000.

Guyer, Reynolds W.: *See—*
Hanson, Steven P., 4,085,539, Cl. 46-1.00C.

Guyot, Lucien, to Thomson-CSF. Non-destructive read-out device. 4,086,515, Cl. 315-10.000.

Gyongyosi, Josef. Twin template cam tracker. 4,085,508, Cl. 33-27.00K.

H. H. Robertson Company: *See—*
Albrecht, Raymond E., 4,085,558, Cl. 52-451.000.

Haass, Adolf, to Siemens Aktiengesellschaft. Circuit arrangement for the automatic adjustment of a two-wire full duplex data transmission system. 4,086,428, Cl. 178-60.000.

Hach Chemical Company: *See—*
Hach, Clifford C., 4,086,062, Cl. 23-259.000.

Hach, Clifford C., to Hach Chemical Company. Digital titration device. 4,086,062, Cl. 23-259.000.

Hadaway, Bernard Milton, to Repco Research Proprietary Limited. Traversing mechanism. 4,085,621, Cl. 74-37.000.

Haefner, Kenneth B.; and Ringwall, Carl G., to General Electric Company. Linear flowmeter. 4,085,615, Cl. 73-194.00B.

Haffmann-La Roche Inc.: *See—*
Arora, Sardari L., 4,086,002, Cl. 350-350.000.

Hagen, Loren M.; and Desai, Ashwin H., to Cole-Parmer Instrument Company. Diaphragm pump. 4,086,036, Cl. 417-413.000.

Hagen, Siegfried Hendrik: *See—*
Knippenberg, Wilhelmus Franciscus; Verspui, Gerrit; and Hagen, Siegfried Hendrik, 4,086,559, Cl. 338-22.00R.

Hager, Robert J.; Johnson, Eric S.; Scott, M. Walter; and Stelzer, Ernest L., to Honeywell Inc. Ohmic contacts to p-type mercury cadmium telluride. 4,085,500, Cl. 29-589.000.

Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., to Pennsylvania Crusher Corporation. Crusher-dryer and method of crushing. 4,085,897, Cl. 241-18.000.

Hainsworth, William Alfred, to Boeing Company, The. Anodize clamp. 4,085,997, Cl. 339-255.00P.

Halfhill, Martin O.: *See—*
Cizmic, Stipe; Edwards, Wayne L., Jr.; Griffith, David L.; Halfhill, Martin O.; Jacques, James O.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,086,659, Cl. 364-900.000.

Hallais, Jean-Philippe, to U.S. Philips Corporation. Method for the epitaxial growth of III-V compounds at homogeneous low temperature utilizing a single flat temperature zone. 4,086,109, Cl. 148-175.000.

Hallar, James O. Liquid supply system for gardens. 4,085,546, Cl. 47-59.000.

Hallum, Charles E.: *See—*
East, George F.; and Hallum, Charles E., 4,085,909, Cl. 244-3.210.

Hamano, Nubuo, to Tomy Kogyo Co., Inc. Amusement device featuring variable lighting effects. 4,085,932, Cl. 272-8.00P.

Hamburg, Douglas R.; and Giardini, Dante S., to Ford Motor Company. Vapor pressure regulator for a vaporized liquid fuel system. 4,085,719, Cl. 123-122.00E.

Hammer, Richard Benjamin: *See—*
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., 4,086,418, Cl. 536-30.000.

Hammond, Thomas J.: *See—*
Gallo, Charles F., Jr.; Hammond, Thomas J.; and Rees, James D., 4,086,010, Cl. 355-70.000.

Hanaki, Yoshimaro: *See—*
Kimura, Toshihiro; Hanaki, Yoshimaro; and Nomura, Humio, 4,085,890, Cl. 235-419.000.

Hancock, Allen W., II: *See—*
Wynkoop, Raymond; and Hancock, Allen W., II, 4,086,270, Cl. 260-515.00P.

Hanert, Eckehard; and Ehlen, Anton, to Benteler-Werke Aktiengesellschaft Werk Neuhaus. Method and apparatus for winding and forming cooling coils. 4,085,488, Cl. 29-33.00G.

Hannebaum, Heinz: *See—*
Nohe, Heinz; and Hannebaum, Heinz, 4,086,250, Cl. 260-346.600.

Hanold, R. C. Frederick, III, to Union Carbide Corporation. Ceramic capacitor made from firing small barium titanate particles. 4,086,649, Cl. 361-321.000.

Hansen, Hans John, to Hoffmann-La Roche Inc. Carcinoembryonic antigens. 4,086,217, Cl. 260-112.00R.

Hansen Manufacturing Company Inc.: *See—*
Manson, Harry G., 4,086,509, Cl. 310-232.000.

Hanson, Arthur Neville, to Hickson's Timber Products Limited. Process for impregnation of timber. 4,086,056, Cl. 21-7.000.

Hanson, Joseph B.: *See—*
Dodson, Raymond M.; and Hanson, Joseph B., 4,086,265, Cl. 260-455.00A.

Hanson, Steven P., to Guyer, Reynolds W. Platform toy. 4,085,539, Cl. 46-1.00C.

Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, to Teijin Limited. Novel nitrogen-containing aromatic polymers and process for their preparation. 4,086,209, Cl. 260-49.000.

Harald Sikora Sikora Industrieelektronik: *See—*
Sikora, Harald, 4,086,472, Cl. 235-92.0DN.

Harrington, Joseph Kenneth: *See—*
Moore, George G. I.; and Harrington, Joseph Kenneth, 4,086,255, Cl. 260-397.600.

Hart, Thomas G., to Energy Development Associates. Gas phase free liquid chlorine electrochemical systems. 4,086,393, Cl. 429-51.000.

Harting, Gary L.; Sutter, Robert F.; and Malo, Lowell L., to ACF Industries, Incorporated. Plastic closure for nailable steel flooring panels. 4,085,683, Cl. 105-424.000.

Hartmann, Heinrich: *See—*
Kempter, Fritz Erdmann; Hartmann, Heinrich; and Spoor, Herbert, 4,086,292, Cl. 260-831.000.

Hartzell, Herschell H.; and Mullaney, Norbert F., to A. O. Smith Corporation. Rod guard for bottom brake rod. 4,085,831, Cl. 188-210.000.

Harvey Hubbell Incorporated: *See—*
Neuroth, David H., 4,085,521, Cl. 34-89.000.

Hasegawa, Akira, to Hitachi, Ltd.; and Nissan Motor Co., Ltd. Apparatus for recording erroneous operations of passenger protecting apparatus for motor vehicles. 4,086,562, Cl. 340-52.00H.

Hashizaki, Kazuo; and Moriya, Ryusuke, to Sony Corporation. Speed and phase control system. 4,086,520, Cl. 318-269.000.

Hattori, Kazuhide: *See—*
Yazaki, Takao; and Hattori, Kazuhide, 4,086,116, Cl. 156-205.000.

Hattori, Tadashi; Nishida, Minoru; and Ueno, Yoshiki, to Nippon Soken, Inc. Electronic ignition timing adjusting system for internal combustion engine. 4,085,714, Cl. 123-117.00R.

Hauser, Oscar G.; and Ruckdeschel, Frederick R., to Xerox Corporation. Purging system for a development apparatus. 4,086,006, Cl. 355-3.0DD.

Hausfeld, Brian A., to United States of America, Air Force. Wall and nozzle assembly for colloidal core reactor. 4,085,582, Cl. 60-203.000.

Havel, Karel. Variable color display device. 4,086,514, Cl. 313-500.000.

Hawkins, Royal R.; and Kuntz, Leland E., to Honeywell Inc. Earth working machine with elevation control for tool thereof. 4,085,805, Cl. 172-4.500.

Hawkins, Russell Olson; and Mallatt, James Francis, to Brunswick Corporation. Thermal protection system for filament wound pressure vessels. 4,085,860, Cl. 220-89.00B.

Hayakawa, Shigeru: *See—*
Nitta, Tsuneharu; Terada, Ziro; and Hayakawa, Shigeru, 4,086,556, Cl. 338-35.000.

Hayashi, Setsuo: *See—*
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, 4,086,429, Cl. 178-69.100.

Hayashi, Torahiko. Bakery flexible belt carrying plate. 4,085,840, Cl. 198-472.000.

Hayes, Ronald F.: *See—*
Garasi, Louis A.; and Hayes, Ronald F., 4,086,318, Cl. 264-135.000.

Hebel, Rudolf: *See—*
Laux, Walter; Hebel, Rudolf; and Schneider, Rolf, 4,086,052, Cl. 432-217.000.

Hebert, Napoleon R. Method of erecting forms for a concrete form. 4,085,495, Cl. 29-469.000.

Heckley, Warner M.: *See—*
Joray, Marvin L.; Heckley, Warner M.; and Gunyou, Lyman J., 4,085,570, Cl. 56-2.000.

Hedberg, Frederick L.: *See—*
Arnold, Fred E.; and Hedberg, Frederick L., 4,086,248, Cl. 260-345.200.

Hedin, David C., to Minnesota Mining and Manufacturing Company. Lens grinding and polishing lap cover and method of making same. 4,086,068, Cl. 51-395.000.

Hehn, Bruce. Embroidery hoops. 4,085,532, Cl. 38-102.200.

Heincker, William R., to United States of America, Air Force. Kinetic energy, impact-separated, follow-through ungula penetrator. 4,085,678, Cl. 102-52.000.

Heiser, Joseph Irvin; and Erb, Edgar Martin, to General Battery Corporation. Multi-slit self-sealing ignition-arrester battery vent. 4,086,395, Cl. 429-88.000.

Helbers, Jan Hendrik, to Sycor, Inc. Method and apparatus for loading flexible magnetic recording discs to transducing heads. 4,086,637, Cl. 360-105.000.

Helena Laboratories Corporation: *See—*
Golias, Tipton L.; and Mayes, David G., 4,086,372, Cl. 427-2.000.

Hell, Hans: *See—*
Thiel, Alfons W.; and Hell, Hans, 4,086,045, Cl. 425-326.100.

Heller, Peter Van Nest. Dispensing containers and holder. 4,085,867, Cl. 222-181.000.

Hellwig, Oskar Alexander, to Beatrice Foods Co. Key case head. 4,085,602, Cl. 70-456.00B.

Heltzel, Carl J. Single load cell weigh hopper system. 4,085,850, Cl. 214-2.000.

Hemmer, Lorenz, to Adidas Fabrique de Chaussures de Sport. Sole for athletic shoe. 4,085,526, Cl. 36-59.00R.

Hengelhaupt, Erich; and Peier, Lothar, to Noverox AG. Rust transforming composition. 4,086,182, Cl. 252-182.000.

Henkel Kommanditgesellschaft Auf Aktien: *See—*
Schmidt-Dunker, Manfred; and Potokar, Matthias, 4,086,334, Cl. 424-177.000.

Henrich, Friedhelm: *See—*
Lanfermann, Willy; Henrich, Friedhelm; and Oberste-Beulmann, Klaus, 4,085,974, Cl. 299-53.000.

Henrion, Michel Andre Robert; and Coudray, Andre Lucien, to International Standard Electric Corporation. Resynchronizing circuit for TDM system. 4,086,437, Cl. 179-15.0AF.

Henry, H. Clarke; and Ranganathan, Ramaswami, to Exxon Research & Engineering Co. Reactivation of deactivated hydrocarbon conversion catalyst by ultrasonic insonation. 4,086,184, Cl. 252-414.000.

Hepworth, Edward C.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mathys, Wilbur L.; Mensch, William D., Jr.; Orgill, Rodney H.; Peddle, Charles I.; and Wiles, Michael F., 4,086,627, Cl. 364-200.000.

Hermann, William J., Jr., to Dickson, Jocelyn, a part interest. Disposable manipulative laboratory device for transferring biological fluids. 4,086,060, Cl. 23-259.000.

Hewlett-Packard Company: *See—*
Kuypers, Ned R., 4,086,031, Cl. 417-154.000.

Hicks, Harry C., to Boeing Company, The. Apparatus for determining stress in an electrodeposit. 4,086,154, Cl. 204-195.00R.

Hicks, John M.: *See—*
Gorman, Joseph G.; Hicks, John M.; and Holmes, Francis Alan, 4,086,645, Cl. 361-155.000.

Hickson's Timber Products Limited: *See—*
Hanson, Arthur Neville, 4,086,056, Cl. 21-7.000.

Hildebrand, George M. Paint tray carrier. 4,085,877, Cl. 224-48.00R.

Hill, James C.: *See—*
Knox, Walter R.; Hill, James C.; Hughes, Lawrence J.; and Foerst, Paul W., 4,086,195, Cl. 260-2.50N.

Hill, James D.: *See—*
Fillmore, Gary L.; Hill, James D.; Robinson, William F.; and Williams, Thomas H., 4,086,601, Cl. 346-75.000.

Hill, James J., to General Medical Appliance Research Corporation. Digital pressure gauge system. 4,086,488, Cl. 250-231.00P.

Hill, Nicholas J.: *See—*
Rei, Nuno M.; and Hill, Nicholas J., 4,086,297, Cl. 260-859.0PV.

Hines, Charles E.; and Stransky, John L., to Outboard Marine Corporation. Bumper device for a vehicle. 4,085,957, Cl. 293-88.000.

Hines, William; Scheithauer, Eric A.; and Cwirzen, Casimir, to Cook Electric Company. Protector module. 4,086,648, Cl. 361-124.000.

Hinselmann, Klaus; Penzien, Klaus; Schick, Rupert; Walter, Manfred; Weber, Heinz; and Wirth, Heinrich, to BASF Aktiengesellschaft. Particulate expandable styrene polymers for the manufacture of foams. 4,086,191, Cl. 260-2.50B.

Hirata, Noritsugu: *See—*
Ishikawa, Kazuo; Sakaguchi, Keiichi; Takigawa, Tomoshi; Hirata, Noritsugu; Tajima, Akira; and Tsuji, Sadahiko, 4,086,605, Cl. 354-270.000.

Hirose, Takeshi: *See—*
Shiba, Keisuke; Hirose, Takeshi; Inouye, Kozo; and Okumura, Akio, 4,086,094, Cl. 96-100.00R.

Hirsch, Allen Frederick, to Ortho Pharmaceutical Corporation. 1-alkenyl thioethers. 4,086,278, Cl. 260-609.00R.

Hisamatsu, Takashi: *See—*
Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, 4,086,415, Cl. 536-22.000.

Hitachi, Ltd.: *See—*
Hasegawa, Akira, 4,086,562, Cl. 340-52.00H.
Itoh, Kiyoo, 4,086,662, Cl. 365-189.000.
Katou, Kazuo; Sase, Takashi; and Horinaka, Ikuho, 4,086,541, Cl. 330-51.000.
Kohashi, Takahiro; Akagi, Motoo; Oba, Yoichi; Nonogaki, Saburo; Tanaka, Makoto; Kaneko, Tadao; and Tomita, Yoshifumi, 4,086,090, Cl. 96-35.100.
Miyamoto, Seigo; Takezoe, Kazuo; Yahagi, Hayao; and Sugimoto, Shigeo, 4,085,596, Cl. 62-476.000.
Tanabe, Seiichi; and Ito, Syoji, 4,086,020, Cl. 415-106.000.
Yamada, Takahiro, 4,086,602, Cl. 346-75.000.
Yoshida, Isao; Hori, Ryoichi; Masuda, Hiroo; Minato, Osamu; Etoh, Jun; and Nakai, Masaaki, 4,086,642, Cl. 361-91.000.

Hites, Clifford C., to American Door Company of Michigan, Inc. Method of producing fire resistant wood products and product thereof. 4,086,382, Cl. 428-168.000.

Hobart Corporation: *See—*
Grunewald, Ernst, 4,085,761, Cl. 134-104.000.

Hochiki Corporation: *See—*
Miyabe, Atsushi, 4,086,574, Cl. 340-227.00R.

Hodge, John D., Jr.: *See—*
McClure, Carroll D.; and Hodge, John D., Jr., 4,086,600, Cl. 346-1.000.

Hodges, Lee R. Lens polishing machine. 4,085,549, Cl. 51-119.000.

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Stroszynski, Joachim, 4,085,522, Cl. 34-156.000.

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Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., 4,086,288, Cl. 260-671.00R.

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Chan, Ka-Kong; and Saucy, Gabriel, 4,086,249, Cl. 260-345.500.
Hansen, Hans John, 4,086,217, Cl. 260-112.00R.

Hogan, Jesse M.; and Hogan, Violet L., to Kap-Key, Inc. Screw cap opener. 4,085,632, Cl. 81-3.30R.

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Holland, Harold: *See—*
Fischer, Don G.; and Holland, Harold, 4,085,599, Cl. 70-14.000.

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Gorman, Joseph G.; Hicks, John M.; and Holmes, Francis Alan, 4,086,645, Cl. 361-155.000.

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Barrons, Keith C.; Smith, Leonard L., Jr.; and Holmsen, Theodore W., 4,086,081, Cl. 71-126.000.

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Holzapfel, Immanuel; and Bruder, Werner, to Daimler-Benz Aktiengesellschaft. Method and apparatus for improving exhaust gases of a gas turbine installation. 4,085,579, Cl. 60-39.040.

Holzner, Julius: *See—*
Jurgens, Wolfgang; Nageler, Jorg; Lippitsch, Josef; and Holzner, Julius, 4,086,308, Cl. 261-124.000.

Hombak Maschinenfabrik KG: *See—*
Sybertz, Hans; and Riedl, Reinhold, 4,085,494, Cl. 29-468.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Otaka, Syoichi, 4,085,715, Cl. 123-117.00A.
Takahashi, Fumitaka, 4,086,455, Cl. 200-76.000.

Honda, Tetsuya; Yagi, Kiyoshi; Shibata, Seiji; and Yamaguchi, Kazuo, to Otowa Electric Company, Ltd. Resistive element having voltage non-linearity and method of making same. 4,086,189, Cl. 252-519.000.

Honebrink, Erik N.; and Myntti, Jon N., to Audio-Sine, Inc. Audio-visual programmer. 4,086,005, Cl. 352-133.000.

Honeywell Inc.: *See—*
Acker, William F., 4,086,536, Cl. 325-137.000.
Chen, Di; and Koepke, Barry G., 4,086,001, Cl. 350-96.140.
Espander, John C., 4,085,843, Cl. 206-328.000.
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Hawkins, Royal R.; and Kuntz, Leland E., 4,085,805, Cl. 172-4.500.
Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,086,106, Cl. 148-33.000.
Schmidt, Roger N., 4,085,729, Cl. 126-270.000.
Severson, Asbjorn M.; and Sampson, Richard L., 4,085,730, Cl. 126-270.000.

Honeywell Information Systems Inc.: *See—*
Negi, Virendra S.; and Miu, Ming T., 4,086,474, Cl. 364-757.000.

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Yoshida, Isao; Hori, Ryoichi; Masuda, Hiroo; Minato, Osamu; Etoh, Jun; and Nakai, Masaaki, 4,086,642, Cl. 361-91.000.

Horian, James G.: *See—*
Horian, Richard C.; and Horian, James G., 4,086,644, Cl. 361-149.000.

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Katou, Kazuo; Sase, Takashi; and Horinaka, Ikuho, 4,086,541, Cl. 330-51.000.

Horine, James H.; Watts, Lowell K.; Wininger, Hershel R.; Kelley, Dale; and Sears, Charles L., to Irvin Industries, Inc. Work tool stand. 4,085,552, Cl. 51-166.00R.

Hornbaker, Edwin D.; Nugent, Adam, Jr.; and Loechelt, Cecil P., to Ethyl Corporation. Steam stripping polyvinyl chloride resins. 4,086,414, Cl. 528-500.000.

Hoshimi, Susumu, to Sony Corporation. Phonograph record player. 4,085,940, Cl. 274-15.00R.

Hosoda, Masao: *See—*
Yoshikawa, Naohiro; Sato, Sadaharu; Matsubara, Masanori; and Hosoda, Masao, 4,085,675, Cl. 101-269.000.

Houser, David J.: *See—*
Wiley, Paul F.; and Houser, David J., 4,086,245, Cl. 260-340.300.

Howe, Frank D., to Ingersoll-Rand Company. Rotor with plastic sheathing. 4,086,043, Cl. 418-152.000.

Huang, Charles Y.; and Stavropoulos, William S., to Dow Chemical Company, The. Decarboxylation of endogenous serum glutamate in transaminase assays. 4,086,142, Cl. 195-103.50R.

Hudson, Barry: *See—*
Bartlett, John Stanley; Hudson, Barry; and Pennington, John, 4,086,267, Cl. 560-241.000.

Hudson Pulp & Paper Corporation: *See—*
Young, Buck R., 4,085,851, Cl. 214-10.50R.

Hugh J. McLaughlin & Son, Inc.: *See—*
Schenk, Bernard H., 4,085,937, Cl. 273-218.000.

Hughes, Lawrence J.: *See—*
Knox, Walter R.; Hill, James C.; Hughes, Lawrence J.; and Foerst, Paul W., 4,086,195, Cl. 260-2.50N.

Hughes, William B., to Phillips Petroleum Company. Dinitrosyldihalo complexes of molybdenum or tungsten. 4,086,229, Cl. 260-270.00D.

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Hunter, Edwin J., to Toro Company, The. Angularity sensor means for center pivot irrigation system. 4,085,771, Cl. 137-344.000.

Hurle, Robert J., to Chestel, Inc. Telephone set with loop current interruption timing control. 4,086,440, Cl. 179-81.00R.

Huron Chemicals Limited: *See—*
Kindl, Bruno; and Atkinson, Jennifer Geraldine, 4,086,150, Cl. 204-95.000.

Hurt, William S., to Rohm and Haas Company. O,S-dialkyl O(S)-sulfonyloxy(thio)phenyl phosphorothiolates and phosphorodi(tri)thioates. 4,086,337, Cl. 424-215.000.

Huseby, Irvin C.; and Klug, Frederic J., to General Electric Company. Methods for increasing the crushability characteristics of cores for casting advanced superalloy materials. 4,086,311, Cl. 264-43.000.

Hutchinson, Florence M., executrix: *See—*
Hutchinson, William Milton, deceased; and Hutchinson, Florence M., executrix, 4,086,180, Cl. 252-171.000.

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Hutto, Ernest L.; and Tovey, Charles A. Vehicle insect protection apparatus. 4,085,964, Cl. 296-91.000.

Hutton, Ronald Eric; and Cross, David Frederic Watson, to Akzona Incorporated. Organic triphosphites having improved hydrolytic stability and a process for stabilizing organic triphosphites. 4,086,304, Cl. 260-989.000.

Hycel, Inc.: *See—*
Vick, Howard Andrew, 4,086,631, Cl. 364-416.000.
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Bouyoucos, John V.; Behnfeldt, Marvin J.; and Selsam, Roger L., 4,086,122, Cl. 156-556.000.

Hyland, Albert L.; and Keene, Robert G., to Polaroid Corporation. Laminar batteries. 4,086,399, Cl. 429-122.000.

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Hysom, Ervin E. Method and apparatus for heating a liquid using solar energy. 4,085,732, Cl. 126-271.000.

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Dorigotti, Luciano; and Parravicini, Francesco, 4,086,343, Cl. 424-250.000.

I-T-E Imperial Corporation: *See—*
Gryctko, Carl E.; Michetti, Anthony B.; and McGinnis, Peter J., 4,085,622, Cl. 74-53.000.

Ibrahim, Abd-El-Fattah Ali: *See—*
Foxall, Thomas George; Ibrahim, Abd-El-Fattah Ali; and Sellars, Lester Porter, 4,086,609, Cl. 357-24.000.

Ibsen, Ole N.; and Anderson, Thomas E., to General Electric Company. Circuit for preventing overdischarge of a battery. 4,086,525, Cl. 320-33.000.

Ichikawa, Tetsuya: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Kurita, Hideaki; Ichikawa, Tetsuya; Sato, Masanari; and Mori, Kaoru, 4,086,136, Cl. 195-29.000.

Ichiyanagi, Toshikazu: *See—*
Kozuki, Susumu; Ichiyanagi, Toshikazu; Watanabe, Yoshiaki; Uchiyama, Takashi; and Sunouchi, Akio, 4,086,584, Cl. 354-38.000.

ICI Australia Limited: *See—*
Jackson, Mervyn Benjamin; and Sasse, Wolfgang Hermann Fritz, 4,086,299, Cl. 260-885.000.

Ido, Kazuo; and Maruyama, Mitsuaki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece calculator. 4,086,654, Cl. 364-705.000.

Ikegami, Seiichi: *See—*
Osujyo, Masahide; Yamanishi, Isamu; Inamori, Akio; Fujikawa, Kaoru; Wakabayashi, Noboru; Ikegami, Seiichi; Okada, Makoto; and Katayama, Morimitsu, 4,085,806, Cl. 172-9.000.

Ikio, Takatoshi. Coke oven door construction. 4,086,231, Cl. 202-248.000.

Illinois Tool Works Inc.: *See—*
Koscik, Richard A., 4,085,651, Cl. 85-72.000.

Ilukowicz, Robert J., to Preco Industries, Ltd. Hog slat reinforcing bar support. 4,085,559, Cl. 52-687.000.

Imamura, Kenso: *See—*
Matsuyama, Shunsuke; Tanahashi, Junichi; Imamura, Kenso; and Majima, Teiji, 4,086,661, Cl. 365-39.000.

Imamura, Shigeyasu: *See—*
Tsuto, Keiichi; Majima, Kanji; and Imamura, Shigeyasu, 4,086,256, Cl. 260-400.000.

Imperial Chemical Industries Limited: *See—*
Balasubramanyan, Sugavanam; and Shephard, Margaret Claire, 4,086,351, Cl. 424-269.000.
Large, Michael Stewart; and Smith, Leslie Harold, 4,086,357, Cl. 424-275.000.
Porter, Kenneth, 4,086,112, Cl. 156-73.100.
Roesler, Frank Cornelius, 4,086,160, Cl. 210-7.000.
Shaw, Bryan; Lawton, Valerie; and McAinsh, James, 4,086,203, Cl. 260-40.00R.
Smith, Trevor James, 4,086,252, Cl. 260-376.000.

Inamori, Akio: *See—*
Osujyo, Masahide; Yamanishi, Isamu; Inamori, Akio; Fujikawa, Kaoru; Wakabayashi, Noboru; Ikegami, Seiichi; Okada, Makoto; and Katayama, Morimitsu, 4,085,806, Cl. 172-9.000.

Inamoto, Yoshiaki; Tsuchihashi, Kiyoshi; Takaishi, Naotake; Fujikura, Yoshiaki; and Aigami, Koji, to Kao Soap Co., Ltd. Tricyclo[6.2.1.$0^{2,6}$]undeca-2(6)-ene and process for hydride transfer reduction rearrangement of same. 4,086,285, Cl. 260-666.0PY.

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Cieslak, Richard F.; and Balding, John V., 4,086,589, Cl. 340-384.00E.

Industrie A. Zanussi S.p.A.: *See—*
Masili, Dino, 4,086,578, Cl. 340-324.0AD.
Industrie Pirelli S.p.A.: *See—*
Maiocchi, Luigi, 4,085,787, Cl. 152-362.00R.
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Inoue, Kenzo. Variable thickness cone for a dynamic speaker and quality control inspection method therefor. 4,086,450, Cl. 179-181.00R.
Inoue, Kunihiro: *See—*
Kouchi, Akihiko; Otake, Tsutomu; Takeshita, Hiroshi; and Inoue, Kunihiro, 4,086,003, Cl. 350-357.000.
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Inoue, Wahei: *See—*
Masumoto, Katashi; Furubayashi, Ei-ichi; and Inoue, Wahei, 4,086,508, Cl. 310-86.000.
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Inque, Sakae: *See—*
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Institute of Gas Technology: *See—*
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Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Punchev, Simeon Georgiev; and Petrov, Peter Dimitrov, 4,085,880, Cl. 226-90.000.
International Business Machines Corporation: *See—*
Ashbee, William Henry, 4,086,470, Cl. 235-92.0DP.
Cowardin, Robert Lewis; and Laurer, George Joseph, 4,086,477, Cl. 235-464.000.
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Finlay, David Ernest, 4,086,658, Cl. 364-900.000.
Karol, Kenneth N., 4,086,114, Cl. 156-153.000.
McBride, Michael Eudell, 4,086,660, Cl. 364-900.000.
Rideout, Vincent L., 4,085,498, Cl. 29-571.000.
Schindler, Hans Rudolf; and Vettiger, Peter, 4,086,447, Cl. 179-170.0NC.
Woodrum, Luther Jay, 4,086,628, Cl. 364-200.000.
International Computers Limited: *See—*
Desyllas, Peter Leo Lawrence; Jones, John Austin; and Procter, Brian John, 4,086,629, Cl. 364-200.000.
International Lead Zinc Research Organization, Inc.: *See—*
Kaiser, Willard D., 4,085,791, Cl. 164-55.000.
International Paper Company: *See—*
Brandon, Ralph E.; Ring, Michael; and Redner, Raymond, III., 4,085,485, Cl. 28-104.000.
International Standard Electric Corporation: *See—*
Henrion, Michel Andre Robert; and Coudray, Andre Lucien, 4,086,437, Cl. 179-15.0AF.
International Telephone and Telegraph Corporation: *See—*
Busch, John Folts; and Freeman, Stephen Morrison, 4,086,067, Cl. 51-296.000.
Carlson, Elmer A., 4,086,048, Cl. 431-46.000.
Cohen, Stuart Barry; Clark, James Monroe; and Magnus, Arthur Howard, 4,086,436, Cl. 179-15.0AF.
Conca, Romeo John; Gray, John Patrick; and Sloan, Tod Hunter, 4,086,129, Cl. 162-49.000.
Johnson, Charles Bruce, 4,086,487, Cl. 250-207.000.
Koslo, Robert C., 4,085,996, Cl. 339-159.00C.
Steensma, Peter Dennis, 4,086,484, Cl. 250-199.000.
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., 4,086,418, Cl. 536-30.000.
Interox Chemicals Ltd.: *See—*
Cardy, Charles Frederick, 4,086,214, Cl. 260-77.5AN.
Ipsen Industries International: *See—*
Luiten, Cornelis Hendricus; and Limque, Ferdinand, 4,086,050, Cl. 432-25.000.
Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., to Phillips Petroleum Company. Acetylenes removal from olefin streams for alkylation by dimethyl formamide absorption. 4,086,288, Cl. 260-671.00R.
Irvin Industries, Inc.: *See—*
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Ishida, Shuichi: *See—*
Nakagawa, Taizo; Ohmori, Kaoru; Watanabe, Yutaka; Tejima, Iwao; Ishida, Shuichi; Suzuki, Toshiyuki; and Yamada, Osamu, 4,086,360, Cl. 424-300.000.
Ishida, Torao; Akiyama, Minoru; Sakurai, Yoshio; and Tsukagoshi, Shigeru, to Asahi Kasei Kogyo Kabushiki Kaisha. Cytidine nucleotide derivatives. 4,086,417, Cl. 536-29.000.
Ishihara, Takeshi: *See—*
Kuninobu, Shigeo; and Ishihara, Takeshi, 4,085,499, Cl. 29-571.000.
Ishii, Kunio: *See—*
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Ishikawa, Kazuo; Sakaguchi, Keiichi; Takigawa, Tomoshi; Hirata, Noritsugu; Tajima, Akira; and Tsuji, Sadahiko, to Canon Kabushiki Kaisha. Diaphragm device. 4,086,605, Cl. 354-270.000.
Isowa, Yoshikazu; Ohmori, Muneki; Kurita, Hideaki; Ichikawa, Tetsuya; Sato, Masanari; and Mori, Kaoru, to (Zaidanhojin) Sagami Chemical Research Center. Process for producing a peptide using a serine or thiol proteinase. 4,086,136, Cl. 195-29.000.
Istituto Chemioterapico Italiano: *See—*
Garzia, Aldo; and Williams, Robert D., 4,086,345, Cl. 424-251.000.
Itagaki, Hideaki: *See—*
Kamikura, Shigeo; Itagaki, Hideaki; Kagaya, Yutaka; and Kawaoka, Ryoiti, 4,085,597, Cl. 66-75.200.
Ito, Fumio; Ito, Tadashi; Mashimo, Yukio; Sakurada, Nobuaki; and Shinoda, Nobuhiko, to Canon Kabushiki Kaisha. Exposure control apparatus. 4,086,581, Cl. 354-23.00D.
Ito, Kunihiro, to Kawasaki Jukogyo Kabushiki Kaisha. Flying shear machine for cutting traveling stock. 4,085,641, Cl. 83-328.000.
Ito, Syoji: *See—*
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Ito, Tadashi: *See—*
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Ito, Yukio; Yasumoto, Yosiro; Masuda, Etsuro; and Suzuki, Hiroshi, to Agency of Industrial Science & Technology. Process for removing nitrogen oxides from gaseous mixtures. 4,086,327, Cl. 423-385.000.
Itoh, Kiyoo, to Hitachi, Ltd. Memory system with read/write control lines. 4,086,662, Cl. 365-189.000.
Ivie, Kert F.: *See—*
Bosley, Roy E.; Mann, Paul T.; Decoteau, Gary D.; Ivie, Kert F.; and Winslow, Elden D., 4,086,368, Cl. 426-464.000.
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Kozuki, Susumu; Uchiyama, Takashi; Ito, Tadashi; Iwashita, Tomonori; Uchidoi, Masanori; and Mashimo, Yukio, 4,086,603, Cl. 354-204.000.
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Izumi, Koji, to Izumi Products Company. Rechargeable battery. 4,086,523, Cl. 320-2.000.
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Izumi, Koji, 4,086,523, Cl. 320-2.000.
J. J. Mason Limited: *See—*
Mason, John James, 4,085,935, Cl. 273-185.00D.
J. Pfrimmer & Co.: *See—*
Fekl, Werner, 4,085,866, Cl. 222-158.000.
Jablin, Richard. Machinery locating device. 4,085,849, Cl. 214-1.0BB.
Jacalone, Richard P., to Olinkraft, Inc. Pallet box pack. 4,085,847, Cl. 206-600.000.
Jackel, John W.: *See—*
Thompson, Leo M.; Anderson, Robert K.; Kocher, Lawrence H.; and Jackel, John W., 4,085,865, Cl. 222-1.000.
Jackson, Amos Ray: *See—*
Vowles, Sandra Rae; Jacobs, Michael Alan; and Jackson, Amos Ray, 4,086,439, Cl. 179-27.0DA.
Jackson, Harold L.; and Mader, Frederick W., to Du Pont de Nemours, E. I., and Company. Drying of water-wet solid materials. 4,085,518, Cl. 34-37.000.
Jackson, Jimmy; and Roquemore, William D. Sprinkler adjustor and escutcheon applicator tool. 4,085,633, Cl. 81-111.000.
Jackson, Mervyn Benjamin; and Sasse, Wolfgang Hermann Fritz, to ICI Australia Limited; and Commonwealth Scientific and Industrial Research Organization. Copolymers of an allylamine grafted onto an unsaturated benzoin copolymer. 4,086,299, Cl. 260-885.000.
Jacobs, David A., to JDS Products, Inc. Combination plug and power cut-off unit. 4,086,643, Cl. 361-92.000.
Jacobs, Michael Alan: *See—*
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Jacoby, Charles H., to Occidental Minerals Corporation. Energy conserving mining system and method. 4,085,971, Cl. 299-4.000.
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Jacubasch, Dieter; Eisenhauer, Rudolf; Greifenberg, Juergen; and Goebel, Rolf-Dieter, to Klockner-Humboldt-Deutz AG. Apparatus for comminution of welding electrode jackets. 4,085,898, Cl. 241-175.000.
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Consaul, James William; and Jadwin, Thomas Arthur, 4,085,702, Cl. 118-60.000.
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Jalaguier, Jean-Pierre, to Societe Nationale Industrielle Aerospatiale. Quick locking and unlocking connector. 4,086,014, Cl. 403-317.000.
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Jankowski, Tadeusz R. Fishing lure. 4,085,538, Cl. 43-17.600.

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Mutoh, Fumio; Koizumi, Hiroshi; Yamasaki, Jun; and Ando, Toshifumi, 4,086,369, Cl. 426-519.000.
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Jayne, Max Leroy, to GTE Sylvania, Incorporated. Longitudinally actuated zero force connector. 4,085,990, Cl. 339-74.00R.
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Jacobs, David A., 4,086,643, Cl. 361-92.000.
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Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, 4,086,348, Cl. 424-256.000.
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Garnier, Pierre Georges; Gaullier, Bruno; and Jeanroy, Gerard Michel, 4,086,625, Cl. 364-104.000.
Jebb, Alan; Rees, James George Arthur; and Lawrence, Raymond, to C. L. Instruments Limited. Axle load monitoring systems. 4,086,576, Cl. 340-272.000.
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Gaines, Donald Raymond; and Jelenic, Bronco Felex, deceased, 4,085,832, Cl. 188-268.000.
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Jensen, Arne, to Danfoss A/S. Method and apparatus for controlling an inverted rectifier. 4,086,623, Cl. 363-41.000.
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John Fluke Mfg. Co., Inc.: *See*—
Fried, Raymond L., 4,086,544, Cl. 331-1.00A.
Johnsen, John Arthur, to Firestone Tire & Rubber Company, The. Tread ring disassembly and reassembly apparatus. 4,086,047, Cl. 425-450.100.
Johnson, Carl B., to Pontiac Furniture Industries, Inc. Swivel thrust bearing. 4,085,983, Cl. 308-134.100.
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Johnson, Eric Shanks; and Schmit, Joseph Lawrence, to Honeywell Inc. Halogen-doped Hg,Cd,Te. 4,086,106, Cl. 148-33.000.
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Johnson & Johnson: *See*—
Ness, Irving Stanley; and Fechillas, Michael R., 4,085,754, Cl. 128-287.000.
Perfect, Alan J., 4,085,845, Cl. 206-564.000.
Johnson, Ralph S. Map vending machine. 4,085,863, Cl. 221-20.000.
Johnston, Thomas F.; and Robinson, Aaron Z., to United States of America, Navy. Secret depth sounder. 4,086,560, Cl. 340-3.00R.
Jones, Bradford H. Recovery of chromium from tannery waste. 4,086,319, Cl. 423-53.000.
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Muller, Joseph M., 4,086,145, Cl. 202-248.000.
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Jonville, Pierre, to Battelle Memorial Institute. Electrolyzer with released gas. 4,086,155, Cl. 204-266.000.
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Juel, Leslie Harrisville; Joo', Louis Arpad; and Tucker, Kenneth Wayne, 4,086,380, Cl. 428-65.000.
Joray, Marvin L.; Heckley, Warner M.; and Gunyou, Lyman J., to Avco Corporation. Forage harvester and attachment therefor. 4,085,570, Cl. 56-2.000.
Jordan, John Francis; and Lampkin, Curtis Magill, to Photon Power, Inc. Photovoltaic cells. 4,086,101, Cl. 136-89.0CD.
Joschko, Gunter; and Schriefl, Karl-Ekkehard, to TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec. Reworking of a playback or recording member guide body. 4,085,939, Cl. 274-1.00R.
Joubert, Jerauld D., to Steiger Tractor Inc. Throttle control for articulated tractor with multiple power plants. 4,085,813, Cl. 180-14.00A.
Juel, Leslie Harrisville; Joo', Louis Arpad; and Tucker, Kenneth Wayne, to Great Lakes Carbon Corporation. Granular disc joints for lengthwise graphitization. 4,086,380, Cl. 428-65.000.
Jukkola, Walfred Wilhelm; and Svencer, Richard Ernest, to Dorr-Oliver Incorporated. Fluidized bed drying process for porous materials. 4,085,516, Cl. 34-10.000.
Jung, Werner. Protective devices for threaded drive shafts. 4,085,625, Cl. 74-89.220.
Jurgens, Wolfgang; Nageler, Jorg; Lippitsch, Josef; and Holzner, Julius, to Siemens Aktiengesellschaft; and Waagner-Biro Aktiengesellschaft. Pressurized relief tank for steam. 4,086,308, Cl. 261-124.000.
Justus, Edgar J., to Beloit Corporation. Control system and method for a multi-channel paper machine distributor. 4,086,130, Cl. 162-123.000.
K. & V. Sorensen Engineering Limited: *See*—
Sorensen, Keld Torben Schneider, 4,085,658, Cl. 91-461.000.
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Muller, Kurt, 4,085,607, Cl. 72-77.000.
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Furuto, Takashi, 4,085,640, Cl. 83-198.000.
Yoshinouchi, Sumio; and Tanaka, Hiroki, 4,085,660, Cl. 92-119.000.
Kabushiki Kaisha Maekawa Seisakusho: *See*—
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Kouchi, Akihiko; Otake, Tsutomu; Takeshita, Hiroshi; and Inoue, Kunihiro, 4,086,003, Cl. 350-357.000.
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Kaeding, Warren W.; and Young, Lewis B., to Mobil Oil Corporation. Selective ethylation of mono alkyl benzenes. 4,086,287, Cl. 260-671.00R.
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Kahn, Daniel W.; and Skidmore, Thomas A., to Teletech Corporation. Automatic interconnection system. 4,086,438, Cl. 179-18.0BE.
Kaiser, Mark E.; and Owen, Peter W., to Dow Chemical Company, The. N-(2-mercapto-ethyl)alkanamides from H_2S and 2-H-2-oxazolines or 2-alkyl-2-oxazolines. 4,086,274, Cl. 260-561.00S.
Kaiser, Mark E.: *See*—
Berazosky, Sandra; and Kaiser, Mark E., 4,086,273, Cl. 260-561.00S.
Kaiser, Willard D., to International Lead Zinc Research Organization, Inc. Method of pore-free die casting. 4,085,791, Cl. 164-55.000.
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Kakac, Karel: *See*—
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Kam, Clifford Y.; Freeman, Vernon L.; and Penton, Allen P., to McDonnell Douglas Corporation. Stiffened composite structural member and method of fabrication. 4,086,378, Cl. 428-36.000.
Kamikura, Shigeo; Itagaki, Hideaki; Kagaya, Yutaka; and Kawaoka, Ryoiti, to Silver Seiko Co., Ltd. Knitting machine coupled with the program reading device. 4,085,597, Cl. 66-75.200.
Kamiya, Shingo, to Nippon Gakki Seizo Kabushiki Kaisha. Complementary push-pull amplifier. 4,086,542, Cl. 330-268.000.
Kampf, Gunther: *See*—
Bottenbruch, Ludwig; Kampf, Gunther; Serini, Volker; and Vernaleken, Hugo, 4,086,310, Cl. 264-41.000.
Kan, Hiroyasu: *See*—
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Kaneko, Tadao: *See*—
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Kao Soap Co., Ltd.: *See*—
Inamoto, Yoshiaki; Tsuchihashi, Kiyoshi; Takaishi, Naotake; Fujikura, Yoshiaki; and Aigami, Koji, 4,086,285, Cl. 260-666.0PY.
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Kap-Key, Inc.: *See*—
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Kaplow, Roy; and Frank, Robert I., to Massachusetts Institute of Technology. Solar-radiation collection apparatus with tracking circuitry. 4,086,485, Cl. 250-203.00R.
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Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, 4,086,027, Cl. 416-184.000.
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Karol, Frederick John; and Wu, Chi-Sung, to Union Carbide Corporation. Ethylene polymerization with silane modified catalyst. 4,086,408, Cl. 526-130.000.
Karol, Frederick John; and Wu, Chi-Sung, to Union Carbide Corporation. Ethylene polymerization with siloxane modified catalyst. 4,086,409, Cl. 526-130.000.
Karol, Kenneth N., to International Business Machines Corporation. Aluminum surface treatment to enhance adhesion in a given direction. 4,086,114, Cl. 156-153.000.
Kartridg Pak Company, The: *See*—
Wells, Roy E., 4,085,779, Cl. 140-93.00A.
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Kasatkin, Vladimir Semenovich: *See*—
Deribas, Andrei Andreevich; Demchuk, Alexandr Fedorovich; Braunshtein, Rudolf Aronovich; Bochkarev, Boris Nikolaevich; Viktorov, Vladimir Borisovich; Karkishko, Gennady Semenovich; Baranov, Sergei Vasilievich; Prakhov, Alexandr Ivanovich; Kasatkin, Vladimir Semenovich; and Rozhkov, Alexandr Timofeevich, 4,085,883, Cl. 228-2.500.
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Katou, Kazuo; Sase, Takashi; and Horinaka, Ikuho, to Hitachi, Ltd. Time division multiplexing amplifier. 4,086,541, Cl. 330-51.000.
Katsuragi, Asaichi: *See*—
Mori, Taketoshi; Goto, Susumu; Katsuragi, Asaichi; and Matsuki, Mutsuo, 4,086,295, Cl. 260-857.00L.
Kaufman, Arnold S.; and Anderson, Robert L., to National Food Service Equipment Fabricators, Inc. Air ventilation and washing system. 4,085,735, Cl. 126-299.00E.
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Kawanabe, Tsuyoshi; and Machida, Minoru, to Canon Kabushiki Kaisha. Signal generator. 4,086,588, Cl. 340-365.00S.
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Kamikura, Shigeo; Itagaki, Hideaki; Kagaya, Yutaka; and Kawaoka, Ryoiti, 4,085,597, Cl. 66-75.200.
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Keldmann, Erik Christian Vilhelm. Baseboard electric heating apparatus. 4,086,468, Cl. 219-377.000.
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Horine, James H.; Watts, Lowell K.; Wininger, Hershel R.; Kelley, Dale; and Sears, Charles L., 4,085,552, Cl. 51-166.00R.
Kelly, John H., to Steel Company of Canada, Limited, The. Drop-weight sample tester. 4,085,609, Cl. 73-101.000.
Kempter, Fritz Erdmann; Hartmann, Heinrich; and Spoor, Herbert, to BASF Aktiengesellschaft. Surface-coating binders. 4,086,292, Cl. 260-831.000.
Kendall Company, The: *See*—
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Kershner, S[illegible]our. Fibrous filter incinerator. 4,085,689, Cl. 110-252.000.
Kervagoret, Gilbert, to Societe Anonyme D.B.A. Power steering mechanism. 4,085,657, Cl. 91-380.000.
Kervagoret, Gilbert, to Societe Anonyme D.B.A. Power steering device. 4,085,817, Cl. 180-132.000.
Keshock, Edward G.: *See*—
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Kestermeier, William J., to Bendix Corporation, The. Disc brake wear indicator. 4,085,827, Cl. 188-1.00A.
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Kimura, Toshihiro; Hanaki, Yoshimaro; and Nomura, Humio, to Okuma Machinery Works Ltd. Position detecting system. 4,085,890, Cl. 235-419.000.
Kindl, Bruno; and Atkinson, Jennifer Geraldine, to Huron Chemicals Limited. Chromate removal by precipitation. 4,086,150, Cl. 204-95.000.
King, John Burnham. Process for isolating fibrinolytic substances. 4,086,140, Cl. 195-66.00B.
King, Ronald J., to NCR Corporation. Control circuit for a code reading device. 4,086,476, Cl. 235-462.000.
King, William J. Inexpensive solar cell and method therefor. 4,086,102, Cl. 136-89.0CC.
Kinoshita, Kazuhisa; and Masamune, Naoki, to Nippon Kokan Kabushiki Kaisha. Method of preventing oxidation of austenitic stainless steel material in high temperature steam. 4,086,104, Cl. 148-12.00E.
Kirschke, John A. Deflection device for measuring the interior of a conduit. 4,085,510, Cl. 33-178.00F.
Kishi, Hajimu; Ohkubo, Tetsuo; and Koikawa, Noriyuki, to Oki Electric Industry Co., Ltd. Numerical control system with program access function. 4,086,633, Cl. 364-474.000.
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Kiyohara, Takehiko; Tsunekawa, Tokuichi; Yazaki, Mutsunobu; Sanada, Noriaki; Taguchi, Tetsuya; and Nakamura, Zenzo, to Canon Kabushiki Kaisha. Exposure control device for a camera. 4,086,582, Cl. 354-33.000.
Klaeger, Dale Edward: *See*—
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Siegfried Hendrik, to U.S. Philips Corporation. Electric resistor based on silicon carbide having a negative temperature coefficient. 4,086,559, Cl. 338-22.00R.

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Knollmueller, Karl O., to Olin Corporation. Alkoxysilane ester cluster compounds and their preparation and use. 4,086,260, Cl. 260-448.80R.

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Knothe, Erich; Berg, Christoph; and Stadler, Eberhard, to Sartorius-Werke GmbH und. vorm. Goettinger Praezisionswaagenfabrik GmbH. Electromagnetically compensating beamless dynamometer or weighing device. 4,085,811, Cl. 177-210.0EM.

Knox, Walter R.; Hill, James C.; Hughes, Lawrence J.; and Foerst, Paul W., to Monsanto Company. Bitumen filled polyester foams. 4,086,195, Cl. 260-2.50N.

Kobayashi, Masaharu: *See—*
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Kohashi, Takahiro; Akagi, Motoo; Oba, Yoichi; Nonogaki, Saburo; Tanaka, Makoto; Kaneko, Tadao; and Tomita, Yoshifumi, to Hitachi, Ltd. Formation of pattern using acrylamide-diacetoneacrylamide copolymer. 4,086,090, Cl. 96-35.100.

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Koizumi, Hiroshi: *See—*
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Kojima, Ichiro; Sato, Hiroshi; and Fujiwara, Yasuo, to Nippon Oil Company, Ltd. Process for producing glucose isomerase. 4,086,138, Cl. 195-65.000.

Koleske, Joseph Victor; and Smith, Oliver Wendell, to Union Carbide Corporation. Polycaprolactone-epoxide adducts and coating compositions thereof. 4,086,294, Cl. 260-834.000.

Koleske, Joseph Victor: *See—*
Smith, Oliver Wendell; and Koleske, Joseph Victor, 4,086,293, Cl. 260-830.00R.

Koller, Horst: *See—*
Biedermann, Wolfgang; Koller, Horst; and Wedemeyer, Karlfried, 4,086,283, Cl. 260-626.00T.

Koller, Karl: *See—*
Scheinecker, Alois; Koller, Karl; and Holleis, Gunter, 4,085,793, Cl. 164-436.000.

Komatsu, Hajime: *See—*
Tanino, Mitsuru; Komatsu, Hajime; and Takemura, Susumu, 4,086,107, Cl. 148-136.000.

Kondo, Hiroshi: *See—*
Shibuya, Tsunenori; and Kondo, Hiroshi, 4,086,040, Cl. 418-76.000.

Konig, Hans-Bodo: *See—*
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,086,340, Cl. 424-246.000.

Kono, Mitsuo: *See—*
Omori, Jimpei; Kono, Mitsuo; Takeuchi, Torataro; and Oikawa, Noboru, 4,086,463, Cl. 219-145.220.

Koppers Company, Inc.: *See—*
Cosby, James L.; and Morgret, Gordon L., 4,086,120, Cl. 156-473.000.
Holter, Samuel N., 4,086,281, Cl. 260-621.00R.

Kormendi, Kalman: *See—*
Lampart, Dieter; and Kormendi, Kalman, 4,086,314, Cl. 264-89.000.

Koscik, Richard A., to Illinois Tool Works Inc. Plastic fastener. 4,085,651, Cl. 85-72.000.

Koshio, Takeshi: *See—*
Tanigaki, Takashi; Koshio, Takeshi; and Tanaka, Yoshikazu, 4,086,389, Cl. 428-385.000.

Koslo, Robert C., to International Telephone and Telegraph Corporation. Cubical three-conductor electrical tap. 4,085,996, Cl. 339-159.00C.

Kostanecki, Mark: *See—*
Cowley, Gerald; Swindells, Richard; and Kostanecki, Mark, 4,086,329, Cl. 423-478.000.

Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, to Chiba Communications Industries, Inc. Synchronizing system for use in telecommunication. 4,086,429, Cl. 178-69.100.

Koubek, Michael, to Siemens Aktiengesellschaft. Method and apparatus for the gamma correction of video signals. 4,086,615, Cl. 358-32.000.

Koubek, Michael, to Siemens Aktiengesellschaft. Process and circuit arrangement for contour correction of the luminance signal in a television camera. 4,086,618, Cl. 358-166.000.

Kouchi, Akihiko; Otake, Tsutomu; Takeshita, Hiroshi; and Inoue, Kunihiro, to Kabushiki Kaisha Suwa Seikosha. Electrochromic display cell. 4,086,003, Cl. 350-357.000.

Kovac, Joseph L. Telescopic sight gun mount. 4,085,511, Cl. 33-250.000.

Kovar, Robert F.; and Arnold, Fred E., to United States of America, Air Force. Bis-ethynyl heterocyclic compositions and method of synthesis. 4,086,232, Cl. 260-250.00Q.

Koziol, Konrad; Sieberer, Karl-Heinz; and Rathjen, Hans-Carl, to Conradty, C. Electrode for electrochemical processes. 4,086,157, Cl. 204-290.00F.

Kozuki, Susumu; Ichiyanagi, Toshikazu; Watanabe, Yoshiaki; Uchiyama, Takashi; and Sunouchi, Akio, to Canon Kabushiki Kaisha. Exposure range changeover circuit for motor driven photographic camera. 4,086,584, Cl. 354-38.000.

Kozuki, Susumu; Uchiyama, Takashi; Ito, Tadashi; Iwashita, Tomonori; Uchidoi, Masanori; and Mashimo, Yukio, to Canon Kabushiki Kaisha. Electrical driving circuit of camera. 4,086,603, Cl. 354-204.000.

Kracht, Wolfgang: *See—*
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,086,346, Cl. 424-253.000.

Krasheninin, Pavel Firsovich: *See—*
Antonov, Sergei Fedorovich; Krasheninin, Pavel Firsovich; Bogdanov, Vyacheslav Mikhailovich; Khramtsov, Andrei Georgievich; and Eremin, Gennady Efimovich, 4,086,366, Cl. 426-14.000.

Kravetz, Louis: *See—*
Kubitschek, Hans E.; and Kravetz, Louis, 4,086,177, Cl. 252-102.000.

Kravetz, Louis N.; and Kubitschek, Hans E., to Shell Oil Company. Activated bleaching process and compositions therefor. 4,086,175, Cl. 252-99.000.

Kreitzberg, Ernest A., to Allis-Chalmers Corporation. Valve assembly for power shift transmission. 4,085,834, Cl. 192-87.130.

Kremer, Manfred, to Still GmbH (vormals SE-Fahrzeugwerke GmbH). Charge monitor for electric battery. 4,086,524, Cl. 320-33.000.

Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-4-methoxymethyl-5-hydroxyimidazolidinones. 4,086,238, Cl. 260-306.80D.

Krenzer, John: *See—*
Wu, Chin Ching; and Krenzer, John, 4,086,240, Cl. 260-306.80R.
Wu, Chin Ching; and Krenzer, John, 4,086,241, Cl. 260-306.80D.

Kretschmer, Frank F., Jr.: *See—*
Lewis, Bernard L.; and Kretschmer, Frank F., Jr., 4,086,592, Cl. 343-100.0LE.

Krikorian, Esther; and Crisp, Michael J., to General Dynamics Corporation. Photoconductive sensor. 4,086,555, Cl. 338-15.000.

Krohn, Wolfgang; Metzger, Karl Georg; Preiss, Michael; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Cephalosporin derivatives. 4,086,341, Cl. 424-246.000.

Kromm, David C.; and Znamirowski, Henry, to Roper Corporation. Decorative drapery rod assembly. 4,085,480, Cl. 16-94.00D.

Kropielnicki, Barbara Ewa; and Kropielnicki, Jerzy Jacek, to B.S.H. Electronics (Manchester) Limited. Electrical signal separating device for combined windshield antenna and heater grid. 4,086,594, Cl. 343-704.000.

Kropielnicki, Jerzy Jacek: *See—*
Kropielnicki, Barbara Ewa; and Kropielnicki, Jerzy Jacek, 4,086,594, Cl. 343-704.000.

Krumrey, Guenter; and Stoeckl, Wilhelm, to Siemens Aktiengesellschaft. X-ray examination apparatus. 4,086,493, Cl. 250-468.000.

Krupp, Leon B. Wheel chair converter. 4,085,946, Cl. 280-289.0WC.

Kubitschek, Hans E.; and Kravetz, Louis, to Shell Oil Company. Activated bleaching process and compositions therefor. 4,086,177, Cl. 252-102.000.

Kubitschek, Hans E.: *See—*
Kravetz, Louis N.; and Kubitschek, Hans E., 4,086,175, Cl. 252-99.000.

Kubo, Sueki; Toso, Katsuya; and Fujita, Masayuki, to Kurosaki Refractories Co., Ltd. Apparatus for automatically repairing the lining of a furnace. 4,085,894, Cl. 239-121.000.

Kubota, Junjiro: *See—*
Tuchiya, Keiji; Kubota, Junjiro; Takahashi, Katuo; and Suzuki, Etsuo, 4,085,929, Cl. 271-122.000.

Kubota, Takashi: *See—*
Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, 4,086,093, Cl. 96-86.00P.

Kubota Tekko Kabushiki Kaisha: *See—*
Osujyo, Masahide; Yamanishi, Isamu; Inamori, Akio; Fujikawa, Kaoru; Wakabayashi, Noboru; Ikegami, Seiichi; Okada, Makoto; and Katayama, Morimitsu, 4,085,806, Cl. 172-9.000.

Kudo, Tsuneo: *See—*
Mitani, Seishu; Kudo, Tsuneo; Mitani, Minoru; and Saido, Shuichi, 4,086,390, Cl. 428-550.000.
Kuechler, Irvin R., to Vent-Cair, Inc. Grease-hood apparatus. 4,085,736, Cl. 126-299.00D.
Kuhn, Horst: *See—*
Stedefeder, Joachim; Dorn, Ingo H.; Kuhn, Horst; Kastenhuber, Walter; and Linke, Wolfgang, 4,086,413, Cl. 528-499.000.
Kuhnemann, Klaus Dieter, to Du Pont of Canada Ltd. Yarn winding apparatus. 4,085,903, Cl. 242-43.100.
Kuijk, Karel Elbert: *See—*
Franssen, Nico Valentinus; Kuijk, Karel Elbert; and Siebelink, Johannes Willem, 4,086,431, Cl. 179-1.0SA.
Kujawski, Stanley Marion: *See—*
Padgitt, Kenneth Warren; and Kujawski, Stanley Marion, 4,086,557, Cl. 338-42.000.
Kumagai, Shigeki, to Tokyo Shibaura Electric Co., Ltd. Display device for electronic apparatus. 4,086,473, Cl. 235-92.0EA.
Kuninobu, Shigeo; and Ishihara, Takeshi, to Matsushita Electric Industrial Co., Ltd. Method of making a MOS-type semiconductor device. 4,085,499, Cl. 29-571.000.
Kuntz, Leland E.: *See—*
Hawkins, Royal R.; and Kuntz, Leland E., 4,085,805, Cl. 172-4.500.
Kuparinen, Lasse, to Koh-I-Noor Rapidograph, Inc. Sealing gasket for a capillary pen cover. 4,086,011, Cl. 401-258.000.
Kurihara, Masaru; Tokizane, Soichi; Tanaka, Tatsundo; Tanimura, Masamitsu; and Shimokawa, Yoichi, to Toray Industries, Inc. Cross-linked organic polyamide or polyhydrazine permselective polymeric membranes. 4,086,215, Cl. 260-78.00R.
Kurita, Hideaki: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Kurita, Hideaki; Ichikawa, Tetsuya; Sato, Masanari; and Mori, Kaoru, 4,086,136, Cl. 195-29.000.
Kurosaki Refractories Co., Ltd.: *See—*
Kubo, Sueki; Toso, Katsuya; and Fujita, Masayuki, 4,085,894, Cl. 239-121.000.
Kusters, Eduard Finkenweg 18: *See—*
Ahrweiler, Klaus; Leifeld, Ferdinand; Quoos, Kurt; and Kusters, Eduard Finkenweg 18, 4,086,316, Cl. 264-120.000.
Kustom, Robert L.; and Wehrle, Robert B., to United States of America, Energy. Contra-rotating homopolar motor-generator for energy storage and return. 4,086,506, Cl. 310-74.000.
Kuypers, Ned R., to Hewlett-Packard Company. Vapor diffusion pump. 4,086,031, Cl. 417-154.000.
Kuzelka, John: *See—*
Steiner, Robert J.; and Kuzelka, John, 4,085,789, Cl. 160-135.000.
Kydd, Paul H., to General Electric Company. Production of water gas as a load leveling approach for coal gasification power plants. 4,085,578, Cl. 60-39.020.
Kyowa Hakko Kogyo Co., Ltd.: *See—*
Nakayama, Kiyoshi; Araki, Kazumi; and Yoshida, Hajime, 4,086,137, Cl. 195-29.000.
Labofina S. A.: *See—*
De Clippeleir, Georges; and Vanderlinden, Andre, 4,086,170, Cl. 252-33.000.
Lace, Melvin A., to Synchro-Start Products, Inc. Amplitude responsive speed switch control. 4,086,647, Cl. 361-239.000.
LaChapelle, Theodore J., Jr.; Davis, John R.; and Licari, James J., to Rockwell International Corporation. Batch process providing beam leads for microelectronic devices having metallized contact pads. 4,086,375, Cl. 427-90.000.
Laeis-Werke AG.: *See—*
Tresser, Dietfried, 4,085,489, Cl. 29-110.000.
Lahm, Albert H., to Donn Products, Inc. Suspension ceiling and recessed lighting system. 4,086,480, Cl. 362-148.000.
Lalich, Michael John: *See—*
Dawson, John Victor; and Lalich, Michael John, 4,086,086, Cl. 75-130.00R.
Lamaison, Jean-Louis: *See—*
Mauvernay, Roland-Yves; Pourrat, Henri-Jean; and Lamaison, Jean-Louis, 4,086,216, Cl. 260-112.00R.
Lambert, Charles F., Jr., to Clayton & Lambert Manufacturing Company. Anti-pollution grain drying apparatus. 4,085,520, Cl. 34-79.000.
Lambrecht, Jurgen Hans Wilhelm. Rotary piston machine of trochoidal construction. 4,086,038, Cl. 418-60.000.
LAMES Societa per Azioni: *See—*
Fogarollo, Pier Paolo, 4,085,629, Cl. 74-625.000.
Lamoria, Lz F.; and Van Dell, Robert D., to Dow Chemical Company, The. Vinylidene chloride polymer latex based cement additives. 4,086,200, Cl. 260-29.60S.
Lamoria, Lz F.: *See—*
Peters, James; VanDell, Robert D.; Eash, R. Douglas; and Lamoria, Lz F., 4,086,201, Cl. 260-29.70S.
Lampart, Dieter; and Kormendi, Kalman, to Elbatainer Kunststoff- und Verpackungs-Gesellschaft mbH. Method of and apparatus for the production of thermoplastic containers. 4,086,314, Cl. 264-89.000.
Lamping, Harold D.: *See—*
Myers, David M.; and Lamping, Harold D., 4,085,712, Cl. 123-205.000.
Lampkin, Curtis Magill: *See—*
Jordan, John Francis; and Lampkin, Curtis Magill, 4,086,101, Cl. 136-89.0CD.
Landry, Ronald L. Back hoe ripper-trencher converter. 4,085,530, Cl. 37-98.000.
Lanese, Philip M., to Belco Pollution Control Corporation. System for the control of rappers in an electrostatic precipitator. 4,086,646, Cl. 361-166.000.
Lanfermann, Willy; Henrich, Friedhelm; and Oberste-Beulmann, Klaus, to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H. Drum cutter. 4,085,974, Cl. 299-53.000.
Lang, William H.: *See—*
Chang, Clarence D.; Lang, William H.; and Silvestri, Anthony J., 4,086,262, Cl. 260-449.60R.
Langberg, Edwin. Fast response thermometer. 4,085,617, Cl. 73-362.0CP.
Langdon, William Keith; and Login, Robert Bernard, to BASF Wyandotte Corporation. Nonionic surfactants. 4,086,279, Cl. 260-615.00B.
Laou, Sio Dhat: *See—*
Biet, Jean-Pierre Henri; and Laou, Sio Dhat, 4,086,613, Cl. 357-54.000.
Large, Michael Stewart; and Smith, Leslie Harold, to Imperial Chemical Industries Limited. Amide derivatives. 4,086,357, Cl. 424-275.000.
Larker, Hans: *See—*
Burstrom, Martin; Larker, Hans; and Nilsson, Jan, 4,085,605, Cl. 72-54.000.
Larsen, Gunnar, to Stal-Laval Turbin AB. Steam power plant with fluidized bed heat source for superheater and method of producing superheated steam. 4,085,593, Cl. 60-676.000.
Larsen, Gunnar Valdemar Hartvig: *See—*
Bye-Jorgensen, Jorgen Steen 4,; Larsen, Gunnar Valdemar Hartvig; and Vermehren, Poul Henrik, 4,085,887, Cl. 233-7.000.
LaSalle Machine Tool, Inc.: *See—*
Sattler, Robert I., 4,085,634, Cl. 82-19.000.
Laurer, George Joseph: *See—*
Cowardin, Robert Lewis; and Laurer, George Joseph, 4,086,477, Cl. 235-464.000.
Lautenschlager, Karl, to Karl Lautenschlager, KG. Hammer-set housing for furniture hinges. 4,085,481, Cl. 16-159.000.
Laux, Walter; Hebel, Rudolf; and Schneider, Rolf, to Didier-Werke AG. Ceramic burner for combustion chamber for hot-blast stove. 4,086,052, Cl. 432-217.000.
Lawrence, Raymond: *See—*
Jebb, Alan; Rees, James George Arthur; and Lawrence, Raymond, 4,086,576, Cl. 340-272.000.
Lawson-Hemphill Inc.: *See—*
Lawson, John B.; Cooper, Charles Simpson; and Vail, Alfred Slocum, 4,085,547, Cl. 51-47.000.
Lawson, John B.; Cooper, Charles Simpson; and Vail, Alfred Slocum, to Lawson-Hemphill Inc. Skate sharpener. 4,085,547, Cl. 51-47.000.
Lawton, Valerie: *See—*
Shaw, Bryan; Lawton, Valerie; and McAinsh, James, 4,086,203, Cl. 260-40.00R.
Lazzaretti, Louis G.: *See—*
Capriotti, Alfred J.; and Lazzaretti, Louis G., 4,085,513, Cl. 33-286.000.
Leach, Daryl: *See—*
Dorsch, Robert; and Leach, Daryl, 4,085,896, Cl. 239-504.000.
Lee, Arnold St. Jacques, to Milstein Medical Research Foundation, Inc. Infusion pumps and dosage control means therefor. 4,085,747, Cl. 128-214.00F.
Lee, James Y.: *See—*
Ogle, James A.; and Lee, James Y., 4,086,516, Cl. 315-169.00R.
Lee, Kyu Tai, to Du Pont de Nemours, E. I., and Company. 6,7-Methylenedioxy-1-(2,2,2-trifluoroethyl)-4(1H)-quinolone-3-carboxylic acid. 4,086,236, Cl. 260-287.0AN.
Leger, Andre: *See—*
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, 4,086,348, Cl. 424-256.000.
Lehn, F. Heinrich; and Schmitter, Hans-Jurgen. Appliance for taking dental impressions and method and apparatus for making the same. 4,085,507, Cl. 32-17.000.
Leiber, Heinz; Gerstenmeier, Jurgen; and Klotz, Hermann, to Teldix GmbH. Testing arrangement for antilocking control system with two identical antilocking control units. 4,085,979, Cl. 303-92.000.
Leifeld, Ferdinand: *See—*
Ahrweiler, Klaus; Leifeld, Ferdinand; Quoos, Kurt; and Kusters, Eduard Finkenweg 18, 4,086,316, Cl. 264-120.000.
Lemkey, Franklin D.: *See—*
Brooks, Clyde S.; Lemkey, Franklin D.; and Golden, Gerald S., 4,086,264, Cl. 252-454.000.
Lenclud, Francois: *See—*
Bouche, Claude; and Lenclud, Francois, 4,086,197, Cl. 260-18.0PN.
Lender, Adam, to GTE Automatic Electric Laboratories Incorporated. Error detector for modified duobinary signals. 4,086,566, Cl. 340-146.1AB.
Lender, Adam, to GTE Automatic Electric Laboratories Incorporated. Apparatus and method for generating a high-accuracy 7-level correlative signal. 4,086,587, Cl. 340-347.0DD.
Lenox Hill Brace Shop: *See—*
Castiglia, Ignatius F., 4,085,758, Cl. 128-589.000.
Lenox Hill Brace Shop, Inc.: *See—*
Castiglia, Ignatius F., 4,085,746, Cl. 128-166.000.
Le Ruyet, Daniel; and De Vos, Daniel, to BFG Glassgroup. Composition of matter comprising cellular aggregate distributed in a binder. 4,086,098, Cl. 106-97.000.
Les Fabriques d'Assortiments Reunies: *See—*
Buhler, Roger; and Faivre, Christian, 4,086,521, Cl. 318-307.000.
Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. 4-(Substituted-amino)-2-(pyridinyl) pyrimidine derivatives. 4,086,233, Cl. 260-256.40C.

Lever Brothers Company: *See*—
Holley, John Ernest Foster, 4,085,780, Cl. 141-1.000.
Levinthal, Michael L., to Thiokol Corporation. Propellant made with cocrystals of cyclotetramethylenetetranitramine and ammonium perchlorate. 4,086,110, Cl. 149-19.400.
Lew, Isaih. Locking device for dental prostheses. 4,085,506, Cl. 32-2.000.
Lewis, Bernard L.; and Kretschmer, Frank F., Jr., to United States of America, Navy. Digital sidelobe canceller. 4,086,592, Cl. 343-100.0LE.
Lewis, David Warren; and Greenlaw, Robert K. Spinal column prostheses orthoses. 4,085,744, Cl. 128-69.000.
Li, Norman N.: *See*—
Cahn, Robert P.; and Li, Norman N., 4,086,163, Cl. 210-22.00D.
Liberts, John: *See*—
Anson, George; and Liberts, John, 4,085,701, Cl. 118-57.000.
Licari, James J.: *See*—
LaChapelle, Theodore J., Jr.; Davis, John R.; and Licari, James J., 4,086,375, Cl. 427-90.000.
Lichte, Leo James: *See*—
Weigl, James; and Lichte, Leo James, 4,085,766, Cl. 137-88.000.
Liedtke, Kurt: *See*—
Focke, Heinz; and Liedtke, Kurt, 4,085,568, Cl. 53-234.000.
Lim, John; and Stamires, Dennis, to Filtrol Corporation. Attrition resistant zeolitic catalyst. 4,086,187, Cl. 252-455.00Z.
Limque, Ferdinand: *See*—
Luiten, Cornelis Hendricus; and Limque, Ferdinand, 4,086,050, Cl. 432-25.000.
Lindbald, Oskar Lennart. Blocking device preferably for reel-type safety belts for vehicles. 4,085,905, Cl. 242-107.40A.
Lindquist, Lars-Olof Edvard; Berglof, Jan Hakan; and Curling, John Malcolm, to Pharmacia Fine Chemicals AB. Method of isolating albumin from blood products. 4,086,222, Cl. 260-122.000.
Lingl Corporation: *See*—
Lingl, Hans, Sr., 4,085,635, Cl. 83-13.000.
Lingl, Hans, Sr., to Lingl Corporation. Wire brick cutter. 4,085,635, Cl. 83-13.000.
Linke, Walter R.: *See*—
Cox, Arthur; and Linke, Walter R., 4,086,000, Cl. 350-54.000.
Linke, Wolfgang: *See*—
Stedefeder, Joachim; Dorn, Ingo H.; Kuhn, Horst; Kastenhuber, Walter; and Linke, Wolfgang, 4,086,413, Cl. 528-499.000.
Linkletter, Merle G.: *See*—
Rempel, Cornelius N.; and Linkletter, Merle G., 4,086,131, Cl. 162-203.000.
Lions, Richard O., to Boeing Company, The. Area navigation system including a map display unit for establishing and modifying navigation routes. 4,086,632, Cl. 364-444.000.
Lippitsch, Josef: *See*—
Jurgens, Wolfgang; Nageler, Jorg; Lippitsch, Josef; and Holzner, Julius, 4,086,308, Cl. 261-124.000.
Lisiecki, Robert E.; Crawford, Duncan J.; and Wise, Daniel J., to Ex-Cell-O Corporation. Liquid proof flat top container with thumb notch release means. 4,085,885, Cl. 229-17.00R.
Lissner, Reinhard: *See*—
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, 4,086,362, Cl. 424-305.000.
Ljung, Bo Hans Gunnar, to Singer Company, The. Seal free liquid bearing. 4,085,982, Cl. 308-76.000.
Lockheed Corporation: *See*—
Allen, William P., Jr., 4,085,740, Cl. 128-2.05R.
Lockwood Corporation: *See*—
Roland, Murray C.; and Norum, Edward M., 4,086,507, Cl. 310-88.000.
Lodge, James Alec; and Jarrett, John James, to EMI Limited. Display apparatus for use in radiography. 4,086,492, Cl. 250-416.0TV.
Loechelt, Cecil P.: *See*—
Hornbaker, Edwin D.; Nugent, Adam, Jr.; and Loechelt, Cecil P., 4,086,414, Cl. 528-500.000.
Logan, Ted Joe: *See*—
Otten, Geneva Gail; Rheinecker, Tom Conrad; and Logan, Ted Joe, 4,086,079, Cl. 71-103.000.
Login, Robert Bernard: *See*—
Langdon, William Keith; and Login, Robert Bernard, 4,086,279, Cl. 260-615.00B.
Lohse, Joseph M.: *See*—
Crowe, Norman P.; and Lohse, Joseph M., 4,085,566, Cl. 53-124.00D.
Long, Thomas Lee: *See*—
Jernstrom, Hans Ebbe Ingevar; and Long, Thomas Lee, 4,085,540, Cl. 46-119.000.
Looker, Robert: *See*—
McLennan, Richard Earl; and Looker, Robert, 4,085,684, Cl. 105-482.000.
Losee, Jon R., to United States of America, Navy. Elliptical flywheel apparatus. 4,085,627, Cl. 74-574.000.
Loukes, David Gordon, to Pilkington Brothers Limited. Electrolytic ion migration into glass. 4,086,073, Cl. 65-30.00E.
Lovell, Robert; and Stott, John K. Reconditionable drill bit assembly. 4,085,809, Cl. 175-410.000.
Lowe, Warren, to Chevron Research Company. Lubricating oil additive composition. 4,086,172, Cl. 252-47.500.
Lucas Industries Limited: *See*—
Bicht, John Richard; and Warner, Peter Stuart, 4,085,945, Cl. 280-106.50R.
Davidson, Charles Patrick Duncan; and Bottoms, Harry Simister, 4,085,814, Cl. 180-33.00C.
Jenkinson, Jeremy Mark, 4,086,481, Cl. 362-428.000.
Lugosi, Robert, to Westinghouse Electric Corporation. Hydrostatic extrusion apparatus for producing hollow elongated bodies of rectangular cross section. 4,085,606, Cl. 72-60.000.
Luigi Franchi S.p.A.: *See*—
Panigoni, Giannantonio, 4,085,654, Cl. 89-191.00A.
Luiten, Cornelis Hendricus; and Limque, Ferdinand, to Ipsen Industries International. Method and apparatus for gas circulation in a heat treating furnace. 4,086,050, Cl. 432-25.000.
Luszcz, Edward T.: *See*—
Baker, William G.; Gisbrecht, James H.; and Luszcz, Edward T., 4,085,910, Cl. 244-3.160.
Mabry, Marshall W.: *See*—
Jones, Roy A.; and Mabry, Marshall W., 4,085,584, Cl. 60-250.000.
Machida, Hiroshi: *See*—
Nishioka, Kazumitsu; and Machida, Hiroshi, 4,086,032, Cl. 417-363.000.
Machida, Minoru: *See*—
Kawanabe, Tsuyoshi; and Machida, Minoru, 4,086,588, Cl. 340-365.00S.
Machinami, Tomoya: *See*—
Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, 4,086,415, Cl. 536-22.000.
Mackey, Lindsay Joan: *See*—
Jarrett, William Fleming Hoggan; Jarrett, James Oswald; and Mackey, Lindsay Joan, 4,086,134, Cl. 195-1.200.
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Marconi, Joseph. Blanking die and holder construction for punch presses. 4,085,639, Cl. 83-157.000.
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Baron, George B., 4,085,854, Cl. 214-138.00R.
Markakis, Michael J., to SCM Corporation. Rotary magnetic storage medium for typewriters. 4,085,836, Cl. 197-19.000.
Marsh, Preston. Farm crop pick-up apparatus. 4,085,573, Cl. 56-364.000.
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Marsili, Leonardo; Rossetti, Vittorio; and Pasqualucci, Carmine, to Archifar Industrie Chimiche del Trentino S.p.A. Rifamycin compounds. 4,086,225, Cl. 260-239.30P.
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Kajino, Jirou; and Ohara, Naoyuki, 4,085,698, Cl. 116-114.00J.
Kuninobu, Shigeo; and Ishihara, Takeshi, 4,085,499, Cl. 29-571.000.
Nitta, Tsuneharu; Terada, Ziro; and Hayakawa, Shigeru, 4,086,556, Cl. 338-35.000.
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Ueda, Yasukiyo; Mori, Keiichi; and Mori, Keijiro, 4,085,921, Cl. 251-129.000.
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McCarthy, James R.; and Moore, Jimmie L., to Dow Chemical Company, The. N,15-Didehydro-15-deoxo-3,15-epi(methano(alkylimino))rifamycins and antimicrobial compositions and methods employing them. 4,086,344, Cl. 424-251.000.
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Kaeding, Warren W.; and Young, Lewis B., 4,086,287, Cl. 260-671.00R.
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Mitchell, Thomas Owen; and Whitehurst, Darrell Duayne, 4,086,261, Cl. 260-449.00M.
Nnadi, John C.; and McIntyre, Margaret H., 4,086,173, Cl. 252-51.50A.
Osborn, Paul V., 4,085,822, Cl. 186-1.00A.
Rubin, Mae K.; Rosinski, Edward J.; and Plank, Charles J., 4,086,186, Cl. 252-430.000.

Mobile Oil Corporation: *See—*
McLeod, Gordon D., 4,086,095, Cl. 106-1.170.
McLeod, Gordon D., 4,086,096, Cl. 106-1.170.

Mochizuki, Hiroshi: *See—*
Tanaka, Eizi; Ohashi, Michihiro; and Mochizuki, Hiroshi, 4,085,723, Cl. 123-139.0AW.

Moleyre, Jacques: *See—*
Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; Simond, Jacques; and Monteil, Andre, 4,086,352, Cl. 424-270.000.

Monaghan, Peter J.: *See—*
Sweet, Robert D., Jr.; and Monaghan, Peter J., 4,086,115, Cl. 156-178.000.

Monsanto Company: *See—*
Argo, Wesley B.; Chen, Gilbert K. C.; Kocatas, Babur M.; and Ziebold, Steven A., 4,086,070, Cl. 55-97.000.
Birum, Gail H., 4,086,205, Cl. 260-45.80R.
Bollinger, Frederic G.; and D'Amico, John J., 4,086,078, Cl. 71-94.000.
Knox, Walter R.; Hill, James C.; Hughes, Lawrence J.; and Foerst, Paul W., 4,086,195, Cl. 260-2.50N.
Morgan, Albert W.; Schumacher, Ignatius; and Vanderlinde, William, 4,086,302, Cl. 260-926.000.

Montagna, Angelo A.: *See—*
McIlvried, Howard G.; and Montagna, Angelo A., 4,086,158, Cl. 208-264.000.

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Toth, Geza; Toth, Istvan; and Montay, Tibor, 4,086,246, Cl. 260-340.90R.

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Gozzo, Franco; Rondanelli, Alfredo; and Rossi, Giorgio, 4,086,226, Cl. 260-239.0BF.

Monteil, Andre: *See—*
Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; Simond, Jacques; and Monteil, Andre, 4,086,352, Cl. 424-270.000.

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Fisher, Howard M.; and Montgomery, Harry T., 4,085,924, Cl. 266-241.000.

Moore, George G. I.; and Harrington, Joseph Kenneth, to Minnesota Mining and Manufacturing Company. Perfluoroalkylsulfonamidoaryl compounds. 4,086,255, Cl. 260-397.600.

Moore, Jimmie L.: *See—*
McCarthy, James R.; and Moore, Jimmie L., 4,086,344, Cl. 424-251.000.

Moore, Raymond H.; and Stegen, Gary E., to United States of America, Energy. Process for removal of sulfur compounds from fuel gases. 4,086,323, Cl. 423-210.500.

Moore, Richard D., to Plastic Techniques, Inc. Disc filter chute liner. 4,086,168, Cl. 210-330.000.

Moore, Robert J.: *See—*
Wood, Donald L.; Moore, Robert J.; and Rhodes, Robert B., 4,086,171, Cl. 252-33.000.

Moran, Robert L.: *See—*
Siwiak, Kazimierz; and Moran, Robert L., 4,086,591, Cl. 343-18.00A.

Moreau, Marc, to Trefimetaux. Method and apparatus for continuously measuring the annealing level on wires or strips. 4,085,922, Cl. 266-90.000.

Morello, Herbert J.: *See—*
Beck, Robert; Morello, Herbert J.; and Richardson, Jack M., 4,085,687, Cl. 109-24.100.

Morgan, Albert W.; Schumacher, Ignatius; and Vanderlinde, William, to Monsanto Company. Phosphoroamidates. 4,086,302, Cl. 260-926.000.

Morgan, Burton D., to Concept Development Institute, Inc. Windmill. 4,086,023, Cl. 416-132.00B.

Morgret, Gordon L.: *See—*
Cosby, James L.; and Morgret, Gordon L., 4,086,120, Cl. 156-473.000.

Mori, Kaoru: *See—*
Isowa, Yoshikazu; Ohmori, Muneki; Kurita, Hideaki; Ichikawa, Tetsuya; Sato, Masanari; and Mori, Kaoru, 4,086,136, Cl. 195-29.000.

Mori, Keiichi: *See—*
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Mori, Keijiro: *See—*
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Mori, Kenshi: *See—*
Saito, Toranosuke; Kitani, Masakatu; Mori, Kenshi; and Izawa, Shinichi, 4,086,206, Cl. 260-45.8NT.

Mori, Koh: *See—*
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Mori, Taketoshi; Goto, Susumu; Katsuragi, Asaichi; and Matsuki, Mutsuo, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyamide composition. 4,086,295, Cl. 260-857.00L.

Morikawa, Tadanori: *See—*
Sakakibara, Shumpei; Morikawa, Tadanori; Munekata, Eisuke; Kimura, Terutoshi; Nakagawa, Yasuo; and Noda, Toshiharu, 4,086,221, Cl. 260-112.50T.

Morinaka, Yasuhiro; and Takahashi, Kazuo, to Mitsubishi Yuka Pharmaceutical Co., Ltd. Quinolopyran-4-one-2-carboxylic acid derivatives and salts thereof as novel compounds and as medicines for treatment of allergic asthma. 4,086,349, Cl. 424-258.000.

Moritz, Robert Rudolph: *See—*
Freeman, Christopher; and Moritz, Robert Rudolph, 4,086,022, Cl. 415-119.000.

Moriya, Ryusuke: *See—*
Hashizaki, Kazuo; and Moriya, Ryusuke, 4,086,520, Cl. 318-269.000.

Morris, James B. N., to Wonder Products Company. Hydril-type connector. 4,085,951, Cl. 285-334.000.

Morris, Lisa Marie. Process for the preparation of powdered metal parts. 4,086,087, Cl. 75-200.000.

Mortier, Frans H.; and Degraeve, Frans, to Sperry Rand Corporation. Resilient mounting for agricultural machinery attachment. 4,085,571, Cl. 56-208.000.

Morton, Douglas Ross, Jr., to Upjohn Company, The. Cis-13-PGD_2 compounds. 4,086,259, Cl. 260-413.000.

Moss, Gerald, to Exxon Research & Engineering Co. Combustion or part-combustion in fluidized beds. 4,085,707, Cl. 122-4.00D.

Moss, Theron V., to South Eastern Cordage Company. Mop constructions and method of making same. 4,085,476, Cl. 15-229.00A.

Motorola, Inc.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mathys, Wilbur L.; Mensch, William D., Jr.; Orgill, Rodney H.; Peddle, Charles I.; and Wiles, Michael F., 4,086,627, Cl. 364-200.000.
Brown, Kenneth Harvey, 4,086,430, Cl. 178-88.000.
Clark, Lowell E.; and Saltich, Jack L., 4,086,610, Cl. 357-34.000.
Gauss, Robert C.; Sathe, Hemant T.; and Wills, Lynn D., 4,086,596, Cl. 343-715.000.
Knappenberger, Thomas A., 4,086,426, Cl. 174-68.500.
Padgitt, Kenneth Warren; and Kujawski, Stanley Marion, 4,086,557, Cl. 338-42.000.
Ryon, Donald Carroll, 4,085,645, Cl. 84-1.010.

Mounier, Francois: *See—*
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Mounts, Frank William: *See—*
Bowen, Edward George; Mounts, Frank William; and Netravali, Arun Narayan, 4,086,620, Cl. 358-260.000.

Mucha, George M.: *See—*
Day, Paul L.; and Mucha, George M., 4,086,464, Cl. 219-156.000.

Mueller, Karl, to Xerox Corporation. Method and apparatus for fuser assembly cooling in an electrostatographic machine. 4,085,794, Cl. 165-1.000.

Mughannam, Adil A., to FMC Corporation. Heat exchange apparatus for products in containers. 4,085,668, Cl. 99-483.000.

Muir, Andrew Redvers; and Vergato, Joseph Anthony, to Perkin-Elmer Corporation, The. Electrical output peak detecting apparatus. 4,086,651, Cl. 364-487.000.

Mulhern, Mary M., executrix: *See—*
Nessler, Charles A., deceased; and Mulhern, Mary M., executrix, 4,086,017, Cl. 408-89.000.

Mullaney, Norbert F.: *See—*
Hartzell, Herschell H.; and Mullaney, Norbert F., 4,085,831, Cl. 188-210.000.

Muller, Hans, to Grapha-Holding AG. Apparatus for gathering folded sheets in bookbinding machines. 4,085,927, Cl. 270-54.000.

Muller, Joseph M., to Jones & Laughlin Steel Corporation. Coke oven door lining. 4,086,145, Cl. 202-248.000.

Muller, Kurt, to Kabel-und Metallwerke Gutehoffnungshutte AG. Helically corrugating tubes. 4,085,607, Cl. 72-77.000.

Muller, Mathias, to Durr - Dental KG. X-ray film processor. 4,086,607, Cl. 354-299.000.

Muller, Monika: *See—*
Borowski, Eva; Braun, Klaus; Breuel, Klaus; Dauth, Christoph; Erge, Dieter; Grawert, Werner; Groger, Detlev; Hohne, Liselotte; Knothe, Edda; Muller, Monika; Nordmann, Gisela; Schirutschke, Rudolf; and Volzke, Klaus-Dieter, 4,086,141, Cl. 195-81.000.

Multifold-International, Inc.: *See—*
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Munekata, Eisuke: *See—*
Sakakibara, Shumpei; Morikawa, Tadanori; Munekata, Eisuke; Kimura, Terutoshi; Nakagawa, Yasuo; and Noda, Toshiharu, 4,086,221, Cl. 260-112.50T.

Murayama, Ken; and Kashihara, Takao, to Toyo Boseki Kabushiki Kaisha. Flame resistant polyesters. 4,086,208, Cl. 260-47.00C.

Murphy, Herbert R. Apparatus for interiorly cleaning lengths of pipe. 4,085,474, Cl. 15-104.10R.

Murphy, Marvin L., Jr.: *See—*
Ezell, George D.; Murphy, Marvin L., Jr.; and Davis, Paul D., Jr., 4,086,504, Cl. 340-15.5TS.

Murray, Robert Malcolm Stuart: *See—*
Pitches, Brian Edward; and Murray, Robert Malcolm Stuart, 4,086,569, Cl. 340-167.00R.

Murray, Russell, to Columbia Research Corporation. System for inspecting can lids for through the lid flaws. 4,086,497, Cl. 250-562.000.

Mutoh, Fumio; Koizumi, Hiroshi; Yamasaki, Jun; and Ando, Toshifumi,

to Japan Oxygen Co., Ltd. Process for freezing cooked rice. 4,086,369, Cl. 426-519.000.
Myers, David M.; and Lamping, Harold D., to Curtiss-Wright Corporation. Rotary engine with pilot and main fuel nozzles downstream of top center. 4,085,712, Cl. 123-205.000.
Myntti, Jon N.: *See—*
Honebrink, Erik N.; and Myntti, Jon N., 4,086,005, Cl. 352-133.000.
Nadelson, Jeffrey, to Sandoz, Inc. Intermediates in the preparation of isoxazolyl benzamides. 4,086,243, Cl. 260-325.0PH.
Nadelson, Jeffrey, to Sandoz, Inc. Substituted isoxazolo pyridinones. 4,086,421, Cl. 544-127.000.
Nagano, Mineo; and Tanaka, Koji, to Toyo Soda Manufacturing Co., Ltd. Method of removing vinyl chloride monomer from a vinyl chloride polymer. 4,086,411, Cl. 528-480.000.
Nageler, Jorg: *See—*
Jurgens, Wolfgang; Nageler, Jorg; Lippitsch, Josef; and Holzner, Julius, 4,086,308, Cl. 261-124.000.
Nagy, Emilia, nee Gera: *See—*
Matolcsy, Gyorgy; Bordas, Barna; Bokor, Gyorgy; Dombay, Zsolt; Pinter, Zoltan; Gregar, Erzsebet, nee Toth; Dudas, Julianna, nee Sz. Kiss; Nagy, Emilia, nee Gera; and Fodor, Istvan, 4,086,339, Cl. 424-245.000.
Nagy, Janos. Multi-bladed knife. 4,085,504, Cl. 30-123.000.
Nahodyl, Richard J., to Grumman Aerospace Corporation. Vertical takeoff and landing aircraft. 4,085,911, Cl. 244-12.400.
Naito, Kazuo: *See—*
Nakauchi, Hideo; Osaki, Toshiyuki; Naito, Kazuo; and Inque, Sakae, 4,086,211, Cl. 260-75.0NA.
Nakagawa, Taizo; Ohmori, Kaoru; Watanabe, Yutaka; Tejima, Iwao; Ishida, Shuichi; Suzuki, Toshiyuki; and Yamada, Osamu, to Nippon Kayaku Kabushiki Kaisha. Phenyl thiol carbanilide derivatives, method for the preparation thereof and use thereof as fungicide for agriculture. 4,086,360, Cl. 424-300.000.
Nakagawa, Yasuo: *See—*
Sakakibara, Shumpei; Morikawa, Tadanori; Munekata, Eisuke; Kimura, Terutoshi; Nakagawa, Yasuo; and Noda, Toshiharu, 4,086,221, Cl. 260-112.50T.
Nakai, Masaaki: *See—*
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Nakamura, Kentaro: *See—*
Nishizawa, Jun-ichi; Nakamura, Kentaro; and Kitsuregawa, Takashi, 4,086,611, Cl. 357-38.000.
Nakamura, Zenzo: *See—*
Kiyohara, Takehiko; Tsunekawa, Tokuichi; Yazaki, Mutsunobu; Sanada, Noriaki; Taguchi, Tetsuya; and Nakamura, Zenzo, 4,086,582, Cl. 354-33.000.
Nakane, Mototaka; and Terada, Takami, to Aisin Seiki Kabushiki Kaisha. Hinge fitting for adjustable back rests of vehicle seats. 4,085,969, Cl. 297-367.000.
Nakano, Koichi: *See—*
Sugio, Akitoshi; Masuda, Yukiya; Kobayashi, Toshihiko; Nakano, Koichi; and Sawai, Tsukasa, 4,086,128, Cl. 156-668.000.
Nakauchi, Hideo; Osaki, Toshiyuki; Naito, Kazuo; and Inque, Sakae, to Bridgestone Tire Company Limited. Method of producing polyurethane products having an improved flex crack resistance. 4,086,211, Cl. 260-75.0NA.
Nakayama, Kiyoshi; Araki, Kazumi; and Yoshida, Hajime, to Kyowa Hakko Kogyo Co., Ltd. Process for the production of L-arginine by fermentation. 4,086,137, Cl. 195-29.000.
Nalco Chemical Company: *See—*
McDermott, Arthur R., 4,086,066, Cl. 44-51.000.
Nance, Jack G.; Owens, James L.; and Robbins, Theodore W., to Western Electric Company, Inc. Switchable attenuator. 4,086,547, Cl. 333-81.00R.
Nance, Jack G.: *See—*
Fulp, William W.; Nance, Jack G.; Owens, James L.; and Robbins, Theodore W., 4,086,546, Cl. 333-81.00R.
Nasuta, Anthony T., Jr.; and Walsh, James W., to Westinghouse Electric Corporation. Common shield-terminating connection in shielded wire bundle. 4,086,427, Cl. 174-88.00C.
National Food Service Equipment Fabricators, Inc.: *See—*
Kaufman, Arnold S.; and Anderson, Robert L., 4,085,735, Cl. 126-299.00E.
National Research Development Corporation: *See—*
Gerzon, Michael Anthony, 4,086,433, Cl. 179-1.0GQ.
Goodfellow, John William; O'Connor, John Joseph; and Shrive, Nigel Graham, 4,085,466, Cl. 3-1.910.
National Starch and Chemical Corporation: *See—*
Tessler, Martin M., 4,086,419, Cl. 536-107.000.
Natori, Minoru, to Citizen Watch Co. Ltd. Electronic timepiece. 4,085,577, Cl. 58-23.00D.
Naturin-Werk Becker & Co.: *See—*
Winkler, Bruno, 4,085,483, Cl. 17-42.000.
Naumann, Klaus. Electronic musical instrument. 4,085,646, Cl. 84-1.090.
Nausedas, Joseph Anthony, to Union Carbide Corporation. Dispenser-cutter for tacky fabric materials. 4,085,878, Cl. 225-19.000.
NCR Corporation: *See—*
King, Ronald J., 4,086,476, Cl. 235-462.000.
Nedden, Klaus Zur: *See—*
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Negi, Virendra S.; and Miu, Ming T., to Honeywell Information Systems Inc. Multiplication technique in a data processing system. 4,086,474, Cl. 364-757.000.
Neier, Benjamin Ray, to B J Manufacturing Company, Inc. Lever-operated feed dispenser. 4,085,869, Cl. 222-271.000.
Nelson, Kris L., to Texas Instruments Incorporated. Pressure relief valve. 4,085,765, Cl. 137-68.00R.
Nelson, Norman A., to Upjohn Company, The. 3-(1'-Hydroxy-2'-hydroxyethyl)-4,6-dihydroxyhexanoic acid 4γ lactone derivatives. 4,086,247, Cl. 260-343.600.
Nelson, Paul A.: *See—*
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,086,404, Cl. 429-220.000.
Nelson, Robert C.; and Toney, David, to New River Manufacturing Company, Inc. Vehicle shock absorbing articulated jointed suspension. 4,085,682, Cl. 105-157.00R.
Nemechek, Alfred Emmerich: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Punchev, Simeon Georgiev; and Petrov, Peter Dimitrov, 4,085,880, Cl. 226-90.000.
Ness, Irving Stanley; and Fechillas, Michael R., to Johnson & Johnson. Disposable diaper inner facing. 4,085,754, Cl. 128-287.000.
Nessler, Charles A., deceased; and by Mulhern, Mary M., executrix. Device for locating piano hammers for drilling. 4,086,017, Cl. 408-89.000.
Netravali, Arun Narayan: *See—*
Bowen, Edward George; Mounts, Frank William; and Netravali, Arun Narayan, 4,086,620, Cl. 358-260.000.
Network Systems Corporation: *See—*
Olson, Gerald R., 4,086,534, Cl. 325-15.000.
Neumann, Peter, to Technion Research and Development Foundation Ltd. Gelatin-based compositions and a method for the generation of stabilized foams therefrom. 4,086,331, Cl. 424-45.000.
Neumann, Peter, to Sandoz Ltd. Certain azolinylamino (azolidinylimino) indazoles. 4,086,353, Cl. 424-272.000.
Neuroth, David H., to Harvey Hubbell Incorporated. Air-steam interface in continuous vulcanization process for allowing accurate optical measurements. 4,085,521, Cl. 34-89.000.
New River Manufacturing Company, Inc.: *See—*
Nelson, Robert C.; and Toney, David, 4,085,682, Cl. 105-157.00R.
Newalls Insulation Company Limited: *See—*
Graham, Robert, 4,085,548, Cl. 51-103.0WH.
Graham, Robert, 4,085,550, Cl. 51-145.00T.
Newman, Gerald H.: *See—*
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Niedermeyer, Karl O. Float switch signalling two different liquid levels. 4,086,457, Cl. 200-84.00R.
Nieuwenhoven, Hendricus Jacobus Cornelis: *See—*
van der Lely, Cornelis; and Nieuwenhoven, Hendricus Jacobus Cornelis, 4,085,853, Cl. 214-77.00R.
NIFCO Inc.: *See—*
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Nigrin, Jan, to Canadian Patents & Development Limited. Travelling wave hybrid junction amplifier. 4,086,543, Cl. 330-287.000.
Nigro, Joseph P.: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., 4,085,897, Cl. 241-18.000.
Nihon Valqua Kogyo Kabushiki Kaisha: *See—*
Yoshida, Mitsuo; Furukawa, Wataru; Yamaguchi, Takashi; and Sasaki, Kazuo, 4,085,942, Cl. 277-30.000.
Nijman, John Peter; and Tompkins, Terence Neville, to Bunker Ramo Corporation. Termination apparatus for electrical connectors. 4,085,497, Cl. 29-566.300.
Nilsson, Jan: *See—*
Burstrom, Martin; Larker, Hans; and Nilsson, Jan, 4,085,605, Cl. 72-54.000.
Nims, Jerry Curtis: *See—*
Wah Lo, Allen Kwok; and Nims, Jerry Curtis, 4,086,585, Cl. 354-115.000.
Nippon Electric Co., Ltd.: *See—*
Tuchiya, Keiji; Kubota, Junjiro; Takahashi, Katuo; and Suzuki, Etsuo, 4,085,929, Cl. 271-122.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Adachi, Takeshi, 4,085,647, Cl. 84-1.240.
Griffith, Glen, 4,085,643, Cl. 84-1.010.
Kamiya, Shingo, 4,086,542, Cl. 330-268.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Nakagawa, Taizo; Ohmori, Kaoru; Watanabe, Yutaka; Tejima, Iwao; Ishida, Shuichi; Suzuki, Toshiyuki; and Yamada, Osamu, 4,086,360, Cl. 424-300.000.
Nippon Kokan Kabushiki Kaisha: *See—*
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Nippon Oil Company, Ltd.: *See—*
Kojima, Ichiro; Sato, Hiroshi; and Fujiwara, Yasuo, 4,086,138, Cl. 195-65.000.
Nippon Soken, Inc.: *See—*
Hattori, Tadashi; Nishida, Minoru; and Ueno, Yoshiki, 4,085,714, Cl. 123-117.00R.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,085,713, Cl. 123-75.00B.
Tanaka, Eizi; Ohashi, Michihiro; and Mochizuki, Hiroshi, 4,085,723, Cl. 123-139.0AW.
Nippon Steel Corporation: *See—*
Tanigaki, Takashi; Koshio, Takeshi; and Tanaka, Yoshikazu, 4,086,389, Cl. 428-385.000.
Tanino, Mitsuru; Komatsu, Hajime; and Takemura, Susumu, 4,086,107, Cl. 148-136.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Asakawa, Shigeru; Sugiyama, Fumio; Gotoh, Akio; and Okamoto, Shigenori, 4,086,537, Cl. 325-478.000.
Takano, Rikuo; Ohta, Yutaka; Sumitomo, Yuji; Shimazawa, Yoichi; and Aiba, Masahiko, 4,085,837, Cl. 197-133.00R.

Nishida, Minoru: *See*—
Hattori, Tadashi; Nishida, Minoru; and Ueno, Yoshiki, 4,085,714, Cl. 123-117.00R.

Nishimura, Kosuke: *See*—
Tanimoto, Akira; and Nishimura, Kosuke, 4,086,655, Cl. 364-705.000.

Nishioka, Kazumitsu; and Machida, Hiroshi, to Mitsubishi Jukogyo Kabushiki Kaisha. Sealed type motor-compressor. 4,086,032, Cl. 417-363.000.

Nishioka, Masato, to Procter & Gamble Company, The. Reclosable twin-Z-fold dispensing valve construction for a liquid containing film pouch. 4,085,886, Cl. 229-62.500.

Nishizawa, Jun-ichi; Nakamura, Kentaro; and Kitsuregawa, Takashi, to Semiconductor Research Foundation; and Mitsubishi Denki Kabushiki Kaisha. Static induction type thyristor. 4,086,611, Cl. 357-38.000.

Nissan Motor Co., Ltd.: *See*—
Amagai, Susumu; Kawai, Shizuya; Kan, Hiroyasu; and Aizawa, Hideo, 4,085,816, Cl. 180-64.00A.
Hasegawa, Akira, 4,086,562, Cl. 340-52.00H.
Minami, Hidehiro, 4,085,716, Cl. 123-119.0EC.
Shimizu, Kazuaki, 4,085,829, Cl. 188-72.500.

Nitta, Tsuneharu; Terada, Ziro; and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd. Humidity sensitive ceramic resistor. 4,086,556, Cl. 338-35.000.

Nittan Company: *See*—
Sasaki, Isao, 4,086,573, Cl. 340-213.00R.

Nnadi, John C.; and McIntyre, Margaret H., to Mobil Oil Corporation. Lubricant compositions containing multifunctional additives. 4,086,173, Cl. 252-51.50A.

Nobuhiro, Iizuka, to Glory Kogyo Kabushiki Kaisha. Paper supplying device in coin wrapping apparatus. 4,085,879, Cl. 225-93.000.

Noda, Mitsuhiko; and Nomura, Kikuo, to Sumitomo Electric Industries, Ltd. Method of disposing of waste water containing emulsified oil. 4,086,164, Cl. 210-46.000.

Noda, Toshiharu: *See*—
Sakakibara, Shumpei; Morikawa, Tadanori; Munekata, Eisuke; Kimura, Terutoshi; Nakagawa, Yasuo; and Noda, Toshiharu, 4,086,221, Cl. 260-112.50T.

Nogami, Tomoyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Vehicular hydraulic brake apparatus. 4,085,978, Cl. 303-6.00C.

Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, to Nippon Soken, Inc. Torch ignition internal combustion engine. 4,085,713, Cl. 123-75.00B.

Nohe, Heinz; and Hannebaum, Heinz, to BASF Aktiengesellschaft. Manufacture of bicyclo[2,2,2]oct-7-ene 2,3,5,6-tetracarboxylic acid dianhydride. 4,086,250, Cl. 260-346.600.

Nomura, Chifuru, to Kitazawa Shoji Kabushiki Kaisha. Electrically driven actuator. 4,085,624, Cl. 74-89.150.

Nomura, Humio: *See*—
Kimura, Toshihiro; Hanaki, Yoshimaro; and Nomura, Humio, 4,085,890, Cl. 235-419.000.

Nomura, Kikuo: *See*—
Noda, Mitsuhiko; and Nomura, Kikuo, 4,086,164, Cl. 210-46.000.

Nomura, Yoshihisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Warning device for friction pad in disk brake. 4,085,824, Cl. 188-1.00A.

Nonogaki, Saburo: *See*—
Kohashi, Takahiro; Akagi, Motoo; Oba, Yoichi; Nonogaki, Saburo; Tanaka, Makoto; Kaneko, Tadao; and Tomita, Yoshifumi, 4,086,090, Cl. 96-35.100.

Nordmann, Gisela: *See*—
Borowski, Eva; Braun, Klaus; Breuel, Klaus; Dauth, Christoph; Erge, Dieter; Grawert, Werner; Groger, Detlev; Hohne, Liselotte; Knothe, Edda; Muller, Monika; Nordmann, Gisela; Schirutschke, Rudolf; and Volzke, Klaus-Dieter, 4,086,141, Cl. 195-81.000.

Nordnero AB: *See*—
Ericson, Harry; and Fredriksson, Carl Otto, 4,086,176, Cl. 252-100.000.

Norian, Roger F.: *See*—
Gorham, Michael L.; and Norian, Roger F., 4,086,443, Cl. 179-90.0BD.

Norman, Thomas W.: *See*—
Bousaid, Issam S.; Brown, Alfred; and Norman, Thomas W., 4,085,799, Cl. 166-272.000.

Norr, Ulf Einar Sigvard, to Atlas Copco Aktiebolag. Pressure fluid impulse converter. 4,085,768, Cl. 137-102.000.

Northern Telecom Limited: *See*—
Foxall, Thomas George; Ibrahim, Abd-El-Fattah Ali; and Sellars, Lester Porter, 4,086,609, Cl. 357-24.000.
Robinson, Ronald Charles, 4,086,445, Cl. 179-121.00R.
Springthorpe, Anthony John; and Rider, Michael John, 4,086,126, Cl. 156-642.000.

Northrop Corporation: *See*—
Baker, William G.; Gisbrecht, James H.; and Luszcz, Edward T., 4,085,910, Cl. 244-3.160.

Norum, Edward M.: *See*—
Roland, Murray C.; and Norum, Edward M., 4,086,507, Cl. 310-88.000.

Noverox AG.: *See*—
Hengelhaupt, Erich; and Peier, Lothar, 4,086,182, Cl. 252-182.000.

Nugent, Adam, Jr.: *See*—
Hornbaker, Edwin D.; Nugent, Adam, Jr.; and Loechelt, Cecil P., 4,086,414, Cl. 528-500.000.

Numol Corporation: *See*—
Brown, John Anthony; and Wilkie, Leslie Raymond, 4,086,046, Cl. 425-361.000.

Nylite Skate Company of Canada Ltd.: *See*—
Chambers, Alan F., 4,085,944, Cl. 280-11.120.

Oba, Yoichi: *See*—
Kohashi, Takahiro; Akagi, Motoo; Oba, Yoichi; Nonogaki, Saburo; Tanaka, Makoto; Kaneko, Tadao; and Tomita, Yoshifumi, 4,086,090, Cl. 96-35.100.

Oberste-Beulmann, Klaus: *See*—
Lanfermann, Willy; Henrich, Friedhelm; and Oberste-Beulmann, Klaus, 4,085,974, Cl. 299-53.000.

O'Brian, Edward D.; and Plachy, William M. Folding, rigid, tent-like structure. 4,085,762, Cl. 135-4.00R.

Occidental Minerals Corporation: *See*—
Jacoby, Charles H., 4,085,971, Cl. 299-4.000.

Oce-van der Grinten, N.V.: *See*—
Winthaegen, Leon M. W.; and Vola, Mathias J. J. M., 4,086,008, Cl. 355-7.000.

O'Connor, John Joseph: *See*—
Goodfellow, John William; O'Connor, John Joseph; and Shrive, Nigel Graham, 4,085,466, Cl. 3-1.910.

Ogata, Yasuhiro: *See*—
Asao, Yasuzi; and Ogata, Yasuhiro, 4,085,949, Cl. 282-27.500.

Ogle, James A.; and Lee, James Y., to Burroughs Corporation. Integrated circuit system for operating display panels. 4,086,516, Cl. 315-169.00R.

Ogura, Katsuyuki: *See*—
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,086,420, Cl. 542-413.000.

Ohara, Naoyuki: *See*—
Kajino, Jirou; and Ohara, Naoyuki, 4,085,698, Cl. 116-114.00J.

Ohashi, Michihiro: *See*—
Tanaka, Eizi; Ohashi, Michihiro; and Mochizuki, Hiroshi, 4,085,723, Cl. 123-139.0AW.

Ohkubo, Tetsuo: *See*—
Kishi, Hajimu; Ohkubo, Tetsuo; and Koikawa, Noriyuki, 4,086,633, Cl. 364-474.000.

Ohmori, Kaoru: *See*—
Nakagawa, Taizo; Ohmori, Kaoru; Watanabe, Yutaka; Tejima, Iwao; Ishida, Shuichi; Suzuki, Toshiyuki; and Yamada, Osamu, 4,086,360, Cl. 424-300.000.

Ohmori, Muneki: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Kurita, Hideaki; Ichikawa, Tetsuya; Sato, Masanari; and Mori, Kaoru, 4,086,136, Cl. 195-29.000.

Ohnstad, Rudy. Platform attachment for a ladder. 4,085,819, Cl. 182-121.000.

Ohta, Yutaka: *See*—
Takano, Rikuo; Ohta, Yutaka; Sumitomo, Yuji; Shimazawa, Yoichi; and Aiba, Masahiko, 4,085,837, Cl. 197-133.00R.

Oikawa, Noboru: *See*—
Omori, Jimpei; Kono, Mitsuo; Takeuchi, Torataro; and Oikawa, Noboru, 4,086,463, Cl. 219-145.220.

Oishi, Kengo: *See*—
Suzuki, Osamu; Oishi, Kengo; Akashi, Goro; and Sega, Kenji, 4,085,907, Cl. 242-199.000.

Oji Yuka Goseishi Kabushiki Kaisha: *See*—
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Oji Yuka Synthetic Paper Sales Co., Ltd.: *See*—
Yamano, Susumu; and Yasuda, Jyunichi, 4,086,383, Cl. 428-174.000.

Okada, Makoto: *See*—
Osujyo, Masahide; Yamanishi, Isamu; Inamori, Akio; Fujikawa, Kaoru; Wakabayashi, Noboru; Ikegami, Seiichi; Okada, Makoto; and Katayama, Morimitsu, 4,085,806, Cl. 172-9.000.

Okada, Takeshi. Endoscope equipped with a film cassette. 4,085,742, Cl. 128-4.000.

Okamoto, Shigenori: *See*—
Asakawa, Shigeru; Sugiyama, Fumio; Gotoh, Akio; and Okamoto, Shigenori, 4,086,537, Cl. 325-478.000.

Okano, Michiaki, to Tokyo Shibaura Electric Co., Ltd. Mark position detecting apparatus. 4,086,478, Cl. 235-466.000.

Oki Electric Industry Co., Ltd.: *See*—
Kishi, Hajimu; Ohkubo, Tetsuo; and Koikawa, Noriyuki, 4,086,633, Cl. 364-474.000.

Okuma Machinery Works Ltd.: *See*—
Kimura, Toshihiro; Hanaki, Yoshimaro; and Nomura, Humio, 4,085,890, Cl. 235-419.000.
Yamaki, Hiromi; and Arai, Hiroaki, 4,086,517, Cl. 318-39.000.

Okumura, Akio: *See*—
Shiba, Keisuke; Hirose, Takeshi; Inouye, Kozo; and Okumura, Akio, 4,086,094, Cl. 96-100.00R.

Olds, Dale F.; Allan, Arnold M.; and Warren, Charles H., to Patent Technology, Inc. Topping for frozen desserts and method of manufacture. 4,086,370, Cl. 426-613.000.

Olin Corporation: *See*—
Knollmueller, Karl O., 4,086,260, Cl. 260-448.80R.

Oline, James A.: *See*—
Carty, Daniel T.; and Oline, James A., 4,086,296, Cl. 260-857.00G.

Olinkraft, Inc.: *See*—
Jacalone, Richard P., 4,085,847, Cl. 206-600.000.

Oliver, Raymond Edward; and Payne, John Blunden, to Matthey

Rustenburg Refiners (Pty) Ltd. Refining of metals. 4,086,084, Cl. 75-118.00R.
Olson, Gerald R., to Network Systems Corporation. Circuit for wire transmission of high frequency data communication pulse signals. 4,086,534, Cl. 325-15.000.
Olson, Lawrence P. Control for reciprocating pumps or the like. 4,085,655, Cl. 91-307.000.
Olszanski, Theodore W.: *See—*
Mathers, James P.; Olszanski, Theodore W.; and Boquist, Carl W., 4,086,396, Cl. 429-103.000.
Olympus Optical Co., Ltd.: *See—*
Saito, Shoichi, 4,086,638, Cl. 360-109.000.
Saitou, Sinichi, 4,086,635, Cl. 360-73.000.
Watanabe, Seizo, 4,086,510, Cl. 310-242.000.
Omori, Jimpei; Kono, Mitsuo; Takeuchi, Torataro; and Oikawa, Noboru, to Tsukishima Kikai Co., Ltd. Flux-cored wire. 4,086,463, Cl. 219-145.220.
Ondetti, Miguel Angel: *See—*
Cushman, David W.; and Ondetti, Miguel Angel, 4,086,338, Cl. 424-244.000.
Onodera, Toshimi: *See—*
Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo; and Shimanuki, Fujio, 4,086,429, Cl. 178-69.100.
Onopchenko, Anatoli; and Schulz, Johann G., to Gulf Research & Development Company. Process for preparing diarylketones. 4,086,277, Cl. 260-591.000.
Opelika Manufacturing Corporation: *See—*
Simonoff, Ely, 4,085,464, Cl. 2-158.000.
Optel Corporation: *See—*
Cartmell, Donald K.; and Witzke, Horst, 4,086,398, Cl. 429-111.000.
Orgill, Rodney H.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mathys, Wilbur L.; Mensch, William D., Jr.; Orgill, Rodney H.; Peddle, Charles I.; and Wiles, Michael F., 4,086,627, Cl. 364-200.000.
Origoverken I Halmstad AB: *See—*
Svensson, Sven Arne; and Ebbeson, Bengt Ebbe Oscar, 4,085,968, Cl. 297-243.000.
Ortabasi, Ugur: *See—*
Minot, Michael Jay; and Ortabasi, Ugur, 4,086,074, Cl. 65-31.000.
Orth, Dieter: *See—*
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, 4,086,362, Cl. 424-305.000.
Ortho Pharmaceutical Corporation: *See—*
Hirsch, Allen Frederick, 4,086,278, Cl. 260-609.00R.
Wachter, Michael P.; and Kanojia, Ramesh Maganlal, 4,086,358, Cl. 424-278.000.
Osaki, Toshiyuki: *See—*
Nakauchi, Hideo; Osaki, Toshiyuki; Naito, Kazuo; and Inque, Sakae, 4,086,211, Cl. 260-75.0NA.
Osborn, Paul V., to Mobil Oil Corporation. Bag assembly and method and apparatus for loading individual bags. 4,085,822, Cl. 186-1.00A.
Ostman, Barry I.; and Roberts, Joseph A., to Advanced Circuit Technology, Inc. Jumper cable. 4,085,502, Cl. 29-629.000.
Osujyo, Masahide; Yamanishi, Isamu; Inamori, Akio; Fujikawa, Kaoru; Wakabayashi, Noboru; Ikegami, Seiichi; Okada, Makoto; and Katayama, Morimitsu, to Kubota Tekko Kabushiki Kaisha. Hydraulic control system for tractor. 4,085,806, Cl. 172-9.000.
Otaka, Syoichi, to Honda Giken Kogyo Kabushiki Kaisha. Ignition timing control system. 4,085,715, Cl. 123-117.00A.
Otake, Tsutomu: *See—*
Kouchi, Akihiko; Otake, Tsutomu; Takeshita, Hiroshi; and Inoue, Kunihiro, 4,086,003, Cl. 350-357.000.
Otis Engineering Corporation: *See—*
Council, Malcolm N., 4,085,796, Cl. 166-77.500.
Otowa Electric Company, Ltd.: *See—*
Honda, Tetsuya; Yagi, Kiyoshi; Shibata, Seiji; and Yamaguchi, Kazuo, 4,086,189, Cl. 252-519.000.
Ott, William F.: *See—*
McCormick, Harold E.; Prasse, Herbert F.; Ott, William F.; and Mayhew, Donald J., 4,085,490, Cl. 29-156.600.
Ottaviano, Gary W., to Ranpak Corporation. Method of making and using cushioning dunnage material. 4,085,662, Cl. 93-1.0WZ.
Otte, Ernst: *See—*
Grulich, Heinz; and Otte, Ernst, 4,086,144, Cl. 201-41.000.
Otten, Geneva Gail; Rheinecker, Tom Conrad; and Logan, Ted Joe, to Procter & Gamble Company, The. Sulfides and derivatives thereof as abscission agents. 4,086,079, Cl. 71-103.000.
Outboard Marine Corporation: *See—*
Hines, Charles E.; and Stransky, John L., 4,085,957, Cl. 293-88.000.
Overkott, Franz Josef: *See—*
Peddinghaus. Carl Ullrich; and Overkott, Franz Josef, 4,085,925, Cl. 267-64.00R.
Owen, Peter W.: *See—*
Kaiser, Mark E.; and Owen, Peter W., 4,086,274, Cl. 260-561.00S.
Owen, Ronald P.; Miller, George A.; and Schneider, Charles M., to Rohm and Haas Company. Phosphonothioureide anthelmintics. 4,086,336, Cl. 424-204.000.
Owens-Corning Fiberglas Corporation: *See—*
Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,085,562, Cl. 53-59.00R.
Roberson, Cletis L., 4,085,881, Cl. 226-95.000.
Sanders, James E., 4,085,901, Cl. 242-18.00G.
Owens, Frederick H.; and Clovis, James S., to Rohm and Haas Company. Acrylic modifiers for polycarbonamides. 4,086,300, Cl. 260-885.000.
Owens-Illinois, Inc.: *See—*
Tobias, John W.; and Taylor, Lynn J., 4,086,373, Cl. 427-44.000.
Owens, James L., to Western Electric Company, Inc. Dual clip connector. 4,085,998, Cl. 339-258.00P.
Owens, James L.: *See—*
Fulp, William W.; Nance, Jack G.; Owens, James L.; and Robbins, Theodore W., 4,086,546, Cl. 333-81.00R.
Nance, Jack G.; Owens, James L.; and Robbins, Theodore W., 4,086,547, Cl. 333-81.00R.
Oyama, Mitsuhiro: *See—*
Soeda, Katsuji; Sakuma, Fumio; and Oyama, Mitsuhiro, 4,085,692, Cl. 112-275.000.
Package Machinery Company: *See—*
Putnam, Roger L., Jr.; Provost, Richard H.; and D'Antonio, Alfred, 4,085,567, Cl. 53-225.000.
Packaging Corporation of America: *See—*
Champlin, Charles L., 4,086,071, Cl. 55-501.000.
Padgitt, Kenneth Warren; and Kujawski, Stanley Marion, to Motorola, Inc. Variable resistance pressure transducer. 4,086,557, Cl. 338-42.000.
Page, John S., Jr. Well tubing anchor with automatic slip release. 4,085,804, Cl. 166-315.000.
Paglia, Richard: *See—*
Finelli, Patrick L.; and Paglia, Richard, 4,086,606, Cl. 354-288.000.
Panigoni, Giannantonio, to Luigi Franchi S.p.A. Gas-operated device for activating the reloading mechanism of a gas-operated automatic rifle. 4,085,654, Cl. 89-191.00A.
Pantazelos, Theophanes G.: *See—*
Rich, Stanley R.; and Pantazelos, Theophanes G., 4,086,152, Cl. 204-176.000.
Papajewski, Reinhold, to Singer Company, The. Needle jogging mechanisms. 4,085,690, Cl. 112-158.00R.
Papasideris, Stamos I., to Caterpillar Tractor Co. Hydrostatic transmission control. 4,085,833, Cl. 192-4.00B.
Park-Ohio Industries, Inc.: *See—*
Day, Paul L.; and Mucha, George M., 4,086,464, Cl. 219-156.000.
Parke, Davis & Company: *See—*
Wittle, Eugene Leroy; and Rebstock, Mildred Catherine, 4,086,219, Cl. 260-112.5LH.
Parravicini, Francesco: *See—*
Dorigotti, Luciano; and Parravicini, Francesco, 4,086,343, Cl. 424-250.000.
Pasqualucci, Carmine: *See—*
Marsili, Leonardo; Rossetti, Vittorio; and Pasqualucci, Carmine, 4,086,225, Cl. 260-239.30P.
Patel, Bhupendra C.; and Boedecker, Steven M., to Kendall Company, The. Liquid measuring and collection device. 4,085,616, Cl. 73-215.000.
Patent Technology, Inc.: *See—*
Olds, Dale F.; Allan, Arnold M.; and Warren, Charles H., 4,086,370, Cl. 426-613.000.
Patterson, Roy M. Practice golf club with means for holding and releasing ball. 4,085,936, Cl. 273-186.00A.
Paxton, Stephen J., to Paxton, Stephen J., Trust. Adjustable automobile vent. 4,085,665, Cl. 98-2.120.
Paxton, Stephen J., Trust: *See—*
Paxton, Stephen J., 4,085,665, Cl. 98-2.120.
Payne, John Blunden: *See—*
Oliver, Raymond Edward; and Payne, John Blunden, 4,086,084, Cl. 75-118.00R.
Payne, John C. Ocean floor surficial dredging apparatus. 4,085,973, Cl. 299-8.000.
Pearsall, Harold I., to Globe Tool and Engineering Company, The. Taping machine. 4,086,117, Cl. 156-212.000.
Peddinghaus, Carl Ullrich; and Overkott, Franz Josef, to Peddinghaus, Carl Ullrich. Hydro-pneumatic shock absorber. 4,085,925, Cl. 267-64.00R.
Peddle, Charles I.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Hepworth, Edward C.; Mathys, Wilbur L.; Mensch, William D., Jr.; Orgill, Rodney H.; Peddle, Charles I.; and Wiles, Michael F., 4,086,627, Cl. 364-200.000.
Pedersen, Jorgen Gammelgaard. Releasable locking device. 4,085,916, Cl. 248-188.000.
Peier, Lothar: *See—*
Hengelhaupt, Erich; and Peier, Lothar, 4,086,182, Cl. 252-182.000.
Pejouhy, Radi; and McMorrow, Joseph L., to Texas Instruments Incorporated. Motor protector and system. 4,086,558, Cl. 337-102.000.
Pendleton, Betty. Analytical system, reagent dispensing and sampling apparatus and method. 4,086,058, Cl. 23-230.00B.
Pennington, John: *See—*
Bartlett, John Stanley; Hudson, Barry; and Pennington, John, 4,086,267, Cl. 560-241.000.
Pennsylvania Crusher Corporation: *See—*
Hahn, William F.; Nigro, Joseph P.; and Wallitsch, Frank, Jr., 4,085,897, Cl. 241-18.000.
Pennsylvania Engineering Corporation: *See—*
Fisher, Howard M.; and Montgomery, Harry T., 4,085,924, Cl. 266-241.000.
Pennwalt Corporation: *See—*
MacLeay, Ronald Edward, 4,086,224, Cl. 260-192.000.
Pennzoil Company: *See—*
Drechsel, Erhart K., 4,086,322, Cl. 423-158.000.

Penton, Allen P.: *See—*
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Penzien, Klaus: *See—*
Hinselmann, Klaus; Penzien, Klaus; Schick, Rupert; Walter, Manfred; Weber, Heinz; and Wirth, Heinrich, 4,086,191, Cl. 260-2.50B.

Perfect, Alan J., to Johnson & Johnson. Container and utility tray. 4,085,845, Cl. 206-564.000.

Perfection Corporation: *See—*
Alewitz, Sam, 4,085,950, Cl. 285-45.000.

Perkin-Elmer Corporation, The: *See—*
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Perper, Edward: *See—*
Post, Herman D.; Perper, Edward; and Alexandrovich, George, Sr., 4,085,926, Cl. 269-295.000.

Persson, Erland K., to Electro-Craft Corporation. Hall effect shaft angle position encoder. 4,086,519, Cl. 318-254.000.

Perzley, William: *See—*
Engelberger, Joseph F.; Dunne, Maurice J.; and Perzley, William, 4,086,522, Cl. 318-568.000.

Peters, James; VanDell, Robert D.; Eash, R. Douglas; and Lamoria, Lz F., to Dow Chemical Company, The. Styrene-butadiene interpolymer latex based cement additives. 4,086,201, Cl. 260-29.70S.

Peterson, Donald John; and Robbins, Medford Dwight, to Procter & Gamble Company, The. Process for the preparation of cyclopropylcarinyl alcohols. 4,086,280, Cl. 260-617.00R.

Peterson, Norbert C.: *See—*
Bell, Leo A.; and Peterson, Norbert C., 4,085,509, Cl. 33-134.00R.

Petkau, Abram; and Pleskach, Stanley Daniel, to Atomic Energy of Canada Limited, The. Labelled phospholipid spheres for organ visualization. 4,086,330, Cl. 424-1.000.

Petron, Roman L. Car-top boat loader. 4,085,859, Cl. 214-450.000.

Petropoulos, Constantine Chris, to Eastman Kodak Company. Radiation sensitive polymeric o-nitrophenyl acetals. 4,086,210, Cl. 260-67.00R.

Petrov, Peter Dimitrov: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Punchev, Simeon Georgiev; and Petrov, Peter Dimitrov, 4,085,880, Cl. 226-90.000.

Petursson, Sigurdur G. Waste control with replaceable cable. 4,085,469, Cl. 4-199.000.

Peuzin, Jean Claude; and Tasson, Michel, to Commissariat a l'Energie Atomique. Method of polarization of a ferroelectric material. 4,086,124, Cl. 156-603.000.

Pevsner, Paul H. Miniature balloon catheter method and apparatus. 4,085,757, Cl. 128-325.

Pfizer Inc.: *See—*
Armstrong, William W., 4,086,332, Cl. 424-80.000.
Bennetch, Leonard N., 4,086,174, Cl. 252-62.560.
Cox, David A.; Barnish, Ian T.; and Evans, Anthony G., 4,086,272, Cl. 260-559.00D.

Pharmacia Fine Chemicals AB: *See—*
Lindquist, Lars-Olof Edvard; Berglof, Jan Hakan; and Curling, John Malcolm, 4,086,222, Cl. 260-122.000.

Phillips Petroleum Company: *See—*
Cichowski, Robert S.; and Farha, Floyd E., Jr., 4,086,290, Cl. 260-680.00E.
Engle, Charles J.; and Runnels, John H., 4,085,800, Cl. 166-288.000.
Farfaglia, Silvio T., 4,085,664, Cl. 93-44.10R.
Fozzard, George B., 4,086,407, Cl. 526-75.000.
Hughes, William B., 4,086,229, Cl. 260-270.00D.
Hutchinson, William Milton, deceased; and Hutchinson, Florence M., executrix, 4,086,180, Cl. 252-171.000.
Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., 4,086,288, Cl. 260-671.00R.
Trantham, Joseph C.; and Meldau, Robert F., 4,085,797, Cl. 166-245.000.
Trepka, William J., 4,086,406, Cl. 526-25.000.

Photon Power, Inc.: *See—*
Jordan, John Francis; and Lampkin, Curtis Magill, 4,086,101, Cl. 136-89.0CD.

Pierce, James N., to Minnesota Mining and Manufacturing Company. Type correction article employing adhesives. 4,085,838, Cl. 197-181.000.

Pilkington Brothers Limited: *See—*
Loukes, David Gordon, 4,086,073, Cl. 65-30.00E.

Piltingsrud, Harley V. Ultra violet radiation personnel hazard meter. 4,086,489, Cl. 250-372.000.

Pinter, Zoltan: *See—*
Matolcsy, Gyorgy; Bordas, Barna; Bokor, Gyorgy; Dombay, Zsolt; Pinter, Zoltan; Gregar, Erz oet, nee Toth; Dudas, Julianna, nee Sz. Kiss; Nagy, Emilia, nee Gera; and Fodor, Istvan, 4,086,339, Cl. 424-245.000.

Piotrowski, Tadeusz, to Piotrowski, Tadeusz; and Societe Nouvelle du Plastique. Production of hollow plastic bodies. 4,086,315, Cl. 264-97.000.

Pitches, Brian Edward; and Murray, Robert Malcolm Stuart, to Ferranti Limited. Communication systems. 4,086,569, Cl. 340-167.00R.

Pitney-Bowes, Inc.: *See—*
Coppola, Vincent G.; Manduley, Flavio M.; and Dlugos, Daniel F., 4,086,530, Cl. 324-133.000.

Plachy, William M.: *See—*
O'Brian, Edward D.; and Plachy, William M., 4,085,762, Cl. 135-4.00R.

Plainville Special Tool, Inc.: *See—*
Michaels, Walter L., 4,085,637, Cl. 83-69.000.

Plank, Charles J.: *See—*
Rubin, Mae K.; Rosinski, Edward J.; and Plank, Charles J., 4,086,186, Cl. 252-430.000.

Plastic Techniques, Inc.: *See—*
Moore, Richard D., 4,086,168, Cl. 210-330.000.

Plattner, Werner, administrator: *See—*
Friebe, Walter-Gunar; Thiel, Max; Stach, Kurt, deceased; Plattner, Werner, administrator; Wilhelms, Otto-Henning; von Mullendorff, Erika; and Sponer, Gisbert, 4,086,347, Cl. 424-253.000.

Pleskach, Stanley Daniel: *See—*
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Poignant, Jean-Claude: *See—*
Vincent, Michel; Remond, Georges; and Poignant, Jean-Claude, 4,086,355, Cl. 424-274.000.

Polaroid Corporation: *See—*
Douglas, Lawrence M., 4,086,604, Cl. 354-219.000.
Finelli, Patrick L.; and Paglia, Richard, 4,086,606, Cl. 354-288.000.
Hyland, Albert L.; and Keene, Robert G., 4,086,399, Cl. 429-122.000.
Hyland, Albert L.; and Mitchnick, Victor, 4,086,400, Cl. 429-122.000.

Politechnika Lodzka: *See—*
Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, 4,086,027, Cl. 416-184.000.

Polychrome Corporation: *See—*
Golda, Eugene; and Wilkes, Alan Leonard, 4,086,092, Cl. 96-86.00R.

Pontiac Furniture Industries, Inc.: *See—*
Johnson, Carl B., 4,085,983, Cl. 308-134.100.

Poole, Eric John, to Compair Industrial Limited. Transmission means for centrifugal compressors. 4,086,019, Cl. 415-18.000.

Poole, William. Check digit numbering mechanisms. 4,085,670, Cl. 101-76.000.

Population Research Incorporated: *See—*
Corey, Harold, 4,086,266, Cl. 260-465.400.

Porochnicki, Jerzy: *See—*
Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, 4,086,027, Cl. 416-184.000.

Porter, Kenneth, to Imperial Chemical Industries Limited. Method of printing fabrics. 4,086,112, Cl. 156-73.100.

Portnoy, Norman A.: *See—*
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., 4,086,418, Cl. 536-30.000.

Post, Herman D.; Perper, Edward; and Alexandrovich, George, Sr., to Robins Industries Corporation. Tape splicer. 4,085,926, Cl. 269-295.000.

Post Office, The: *See—*
Jones, Ralph Archibald, 4,086,432, Cl. 179-1.0CN.

Potapczyk, Andrzej: *See—*
Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, 4,086,027, Cl. 416-184.000.

Potokar, Matthias: *See—*
Schmidt-Dunker, Manfred; and Potokar, Matthias, 4,086,334, Cl. 424-177.000.

Poul Hahn Evers: *See—*
Grudelbach, Hans-Dieter, 4,086,526, Cl. 323-34.000.

Pourrat, Henri-Jean: *See—*
Mauvernay, Roland-Yves; Pourrat, Henri-Jean; and Lamaison, Jean-Louis, 4,086,216, Cl. 260-112.00R.

Powell, James R.; and Salzano, Francis J., to United States of America, Energy. Hydride compressor. 4,085,590, Cl. 60-673.000.

PPG Industries, Inc.: *See—*
Barch, Herbert W.; and Bohy, August G., 4,085,487, Cl. 28-252.000.
Cherenko, Joseph P.; and Shaw, Hugh E., Jr., 4,086,595, Cl. 343-713.000.
Martinsons, Aleksandrs; and Crenshaw, Marilyn, 4,086,149, Cl. 204-59.00R.
Rowley, James R., 4,086,263, Cl. 206-454.000.

Prakhov, Alexandr Ivanovich: *See—*
Deribas, Andrei Andreevich; Demchuk, Alexandr Fedorovich; Braunshtein, Rudolf Aronovich; Bochkarev, Boris Nikolaevich; Viktorov, Vladimir Borisovich; Karkishko, Gennady Semenovich; Baranov, Sergei Vasilievich; Prakhov, Alexandr Ivanovich; Kasatkin, Vladimir Semenovich; and Rozhkov, Alexandr Timofeevich, 4,085,883, Cl. 228-2.500.

Prasse, Herbert F.: *See—*
McCormick, Harold E.; Prasse, Herbert F.; Ott, William F.; and Mayhew, Donald J., 4,085,490, Cl. 29-156.600.

Preco Industries, Ltd.: *See—*
Ilukowicz, Robert J., 4,085,559, Cl. 52-687.000.

Preiss, Michael: *See—*
Krohn, Wolfgang; Metzger, Karl Georg; Preiss, Michael; and Walkowiak, Michael, 4,086,341, Cl. 424-246.000.
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, 4,086,340, Cl. 424-246.000.

Prescott, Roger N.: *See—*
Calder, Brooke J., Jr.; Belock, Robert J.; and Prescott, Roger N., 4,085,676, Cl. 102-23.000.

Procter, Brian John: *See—*
Desyllas, Peter Leo Lawrence; Jones, John Austin; and Procter, Brian John, 4,086,629, Cl. 364-200.000.

Procter & Gamble Company, The: *See—*
Gellert, Dale Albert, 4,085,753, Cl. 128-284.000.
Nishioka, Masato, 4,085,886, Cl. 229-62.500.
Otten, Geneva Gail; Rheinecker, Tom Conrad; and Logan, Ted Joe, 4,086,079, Cl. 71-103.000.
Peterson, Donald John; and Robbins, Medford Dwight, 4,086,280, Cl. 260-617.00R.

Prorea S.A.: *See—*
Sergot, Joseph, 4,086,069, Cl. 55-48.000.

Provost, Richard H.: *See—*
Putnam, Roger L., Jr.; Provost, Richard H.; and D'Antonio, Alfred, 4,085,567, Cl. 53-225.000.

Prudhon, Francois; Fantino, Jean; and Mounier, Francois, to Rhone-Poulenc Industries. Method of preparing plaster. 4,086,099, Cl. 106-109.000.

Prunier, Louis, to American Optical Corporation. Lens surfacing adaptor. 4,085,553, Cl. 51-216.0LP.

Prywer, Jerzy: *See—*
Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, 4,086,027, Cl. 416-184.000.

Psota, Joseph M.: *See—*
Mahaffy, Reid A.; Psota, Joseph M.; and Giordano, John A., 4,085,565, Cl. 53-112.00A.

Public Service Company of Colorado: *See—*
Watts, Fred S., Jr.; and Beecher, Lynn Loren, 4,086,568, Cl. 340-147.00R.

Punchev, Simeon Georgiev: *See—*
Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Punchev, Simeon Georgiev; and Petrov, Peter Dimitrov, 4,085,880, Cl. 226-90.000.

Puskas, Imre: *See—*
Cengel, John A.; and Puskas, Imre, 4,086,251, Cl. 260-346.740.

Pustell, Robert A.: *See—*
Tassie, Douglas Pray; and Pustell, Robert A., 4,085,653, Cl. 89-7.000.

Putnam, Roger L., Jr.; Provost, Richard H.; and D'Antonio, Alfred, to Package Machinery Company. High speed wrapping machine with rotary folder. 4,085,567, Cl. 53-225.000.

Q-S Oxygen Processes, Inc.: *See—*
Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 4,085,923, Cl. 266-215.000.

Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., to Q-S Oxygen Processes, Inc. Apparatus for a metallurgical process using oxygen. 4,085,923, Cl. 266-215.000.

Quoos, Kurt: *See—*
Ahrweiler, Klaus; Leifeld, Ferdinand; Quoos, Kurt; and Kusters, Eduard Finkenweg 18, 4,086,316, Cl. 264-120.000.

Radio Mechanical Structures, Inc.: *See—*
VanderLinden, Paul Guisbert, Jr.; and Crutcher, James Elwyn, 4,086,599, Cl. 343-881.000.

Radunz, Hans-Eckart: *See—*
Baumgarth, Manfred; Radunz, Hans-Eckart; Orth, Dieter; Lissner, Reinhard; Enenkel, Hans-Joachim; and Zeelen, Filippus Johannes, 4,086,362, Cl. 424-305.000.

Ragle, Herbert Underwood; and DeMoss, Dean L., to Burroughs Corporation. Partitionable portable flexible disk pack. 4,086,640, Cl. 360-133.000.

Ragle, Herbert Underwood; and DeMoss, Dean, to Burroughs Corporation. Partitionable portable flexible disk pack. 4,086,641, Cl. 360-133.000.

Raidl, John H., Jr. Apparatus for protecting a gas pressure system from over pressure. 4,085,764, Cl. 137-68.00R.

Rainin, Edgar A.; and Major, Emery. Intraocular lens. 4,085,467, Cl. 3-13.000.

Raley, Charles F., Jr., to Dow Chemical Company, The. Olefin polymer composition having reduced flame propagation characteristics. 4,086,192, Cl. 260-2.5FP.

Ralston Purina Company: *See—*
Snetsinger, David C.; and Zimmerman, Ray A., 4,086,365, Cl. 426-2.000.

Ramsey Corporation: *See—*
McCormick, Harold E.; Prasse, Herbert F.; Ott, William F.; and Mayhew, Donald J., 4,085,490, Cl. 29-156.600.

Ranganathan, Ramaswami: *See—*
Henry, H. Clarke; and Ranganathan, Ramaswami, 4,086,184, Cl. 252-414.000.

Ranpak Corporation: *See—*
Ottaviano, Gary W., 4,085,662, Cl. 93-1.0WZ.

Rao, Purushothama: *See—*
Mao, George W.; and Rao, Purushothama, 4,086,392, Cl. 429-50.000.

Ratcliffe, Ronald W.: *See—*
Firestone, Raymond A.; Ratcliffe, Ronald W.; and Christensen, Burton G., 4,086,423, Cl. 544-21.000.

Rathert. Horst: *See—*
Schilling, Karl; and Rathert, Horst, 4,085,694, Cl. 114-163.000.

Rathjen, Hans-Carl: *See—*
Koziol, Konrad; Sieberer, Karl-Heinz; and Rathjen, Hans-Carl, 4,086,157, Cl. 204-290.00F.

Ray, Robert A.: *See—*
Hoffa, Jack L.; and Ray, Robert A., 4,086,061, Cl. 23-259.000.

Raymond Lee Organization Inc., The: *See—*
Hoot, Eric F., 4,085,785, Cl. 150-.500.

Raytheon Company: *See—*
Siwiak, Kazimierz; and Moran, Robert L., 4,086,591, Cl. 343-18.00A.

RCA Corporation: *See—*
Baker, Alfred Lynn, 4,086,617, Cl. 358-128.000.
Easter, Finis Claude, 4,086,579, Cl. 340-324.0AD.
Evans, John, Jr., deceased, 4,086,513, Cl. 313-414.000.
Upadhyayula, Lakshminarasimha Chainulu, 4,086,501, Cl. 307-299.00R.

Reams, Lowell A.; and Dunlap, Thomas F., to Ford Motor Company. Concentric crossflow recuperator for stirling engine. 4,085,588, Cl. 60-517.000.

Rebstock, Mildred Catherine: *See—*
Wittle, Eugene Leroy; and Rebstock, Mildred Catherine, 4,086,219, Cl. 260-112.5LH.

Redman, Charles M., to United States of America, Army. Millimeter imaging device. 4,086,511, Cl. 313-101.000.

Redner, Raymond, III.: *See—*
Brandon, Ralph E.; Ring, Michael; and Redner, Raymond, III., 4,085,485, Cl. 28-104.000.

Redwine, Fletcher H.: *See—*
Crane, Robert M.; and Redwine, Fletcher H., 4,086,029, Cl. 417-53.000.

Rees, James D.: *See—*
Gallo, Charles F., Jr.; Hammond, Thomas J.; and Rees, James D., 4,086,010, Cl. 355-70.000.

Rees, James George Arthur: *See—*
Jebb, Alan; Rees, James George Arthur; and Lawrence, Raymond, 4,086,576, Cl. 340-272.000.

Rei, Nuno M.; and Hill, Nicholas J., to Ventron Corporation. Method of making polymeric compositions and compositions therefor. 4,086,297, Cl. 260-859.0PV.

Reichle, Walter Thomas, to Union Carbide Corporation. Catalyst for aldol condensations. 4,086,188, Cl. 252-463.000.

Reischl, Artur, to Bayer Aktiengesellschaft. Microporous sheets and a process for making them. 4,086,193, Cl. 260-2.5AY.

Remond, Georges: *See—*
Vincent, Michel; Remond, Georges; and Poignant, Jean-Claude, 4,086,355, Cl. 424-274.000.

Rempel, Cornelius N.; and Linkletter, Merle G., to Beloit Corporation. Method for pressing bagasse webs. 4,086,131, Cl. 162-203.000.

Repco Research Proprietary Limited: *See—*
Hadaway, Bernard Milton, 4,085,621, Cl. 74-37.000.

Reyrolle Parsons Limited: *See—*
Gonek, Stanislaw Mieczyslaw, 4,086,461, Cl. 200-148.00R.

Rheinecker, Tom Conrad: *See—*
Otten, Geneva Gail; Rheinecker, Tom Conrad; and Logan, Ted Joe, 4,086,079, Cl. 71-103.000.

Rheinstahl AG: *See—*
Dahlem, Werner, 4,085,592, Cl. 61-45.00D.

Rhodes, Robert B.: *See—*
Wood, Donald L.; Moore, Robert J.; and Rhodes, Robert B., 4,086,171, Cl. 252-33.000.

Rhone-Poulenc Industries: *See—*
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Leger, Andre, 4,086,348, Cl. 424-256.000.
Daniel, Jean-Claude, 4,086,199, Cl. 260-29.7UP.
Prudhon, Francois; Fantino, Jean; and Mounier, Francois, 4,086,099, Cl. 106-109.000.

Rich, Joseph A., to General Electric Company. Rod array vacuum switch for high voltage operation. 4,086,459, Cl. 200-144.00B.

Rich, Stanley R.; and Pantazelos, Theophanes G., to RP Industries, Inc. Ozone concentrating. 4,086,152, Cl. 204-176.000.

Richard, Joseph D. Thermal energy flowmeter. 4,085,613, Cl. 73-193.00R.

Richards, Fred F. Two handed momentary actuator. 4,085,626, Cl. 74-110.000.

Richards, William E.: *See—*
Catano, Paul S.; and Richards, William E., 4,086,616, Cl. 358-81.000.

Richardson Company, The: *See—*
Song, Il H., 4,086,410, Cl. 526-264.000.

Richardson, David A.: *See—*
Curran, John R.; Sgourakes, George E.; and Richardson, David A., 4,085,614, Cl. 73-194.0VS.

Richardson, Jack M.: *See—*
Beck, Robert; Morello, Herbert J.; and Richardson, Jack M., 4,085,687, Cl. 109-24.100.

Richtzenhain, Hermann: *See—*
Daum, Gerhard; and Richtzenhain, Hermann, 4,086,237, Cl. 260-290.00P.

Rickard, Bryan W. Repertory diallers. 4,086,442, Cl. 179-90.0CS.

Ricouard, Jean-Pierre; and Schorter, Bruno, to U.S. Philips Corporation. Hall effect apparatus for determining the angular position of a rotating part. 4,086,533, Cl. 324-208.000.

Rideout, Vincent L., to International Business Machines Corporation. Fabrication of integrated circuits containing enhancement-mode FETs and depletion-mode FETs with two layers of polycrystalline silicon utilizing five basic pattern delineating steps. 4,085,498, Cl. 29-571.000.

Rider, Michael John: *See—*
Springthorpe, Anthony John; and Rider, Michael John, 4,086,126, Cl. 156-642.000.

Riedel, Guenther: *See—*
Seibert, Walter; Riedel, Guenther; and Mayer, Kurt, 4,086,054, Cl. 8-89.00R.

Riedl, Reinhold: *See*—
Sybertz, Hans; and Riedl, Reinhold, 4,085,494, Cl. 29-468.000.
Riggs, Donnie E. Athletic shoe. 4,085,527, Cl. 36-114.000.
Ring, Michael: *See*—
Brandon, Ralph E.; Ring, Michael; and Redner, Raymond, III., 4,085,485, Cl. 28-104.000.
Ringe, Stephen J., to Fruehauf Corporation. Door header construction. 4,085,966, Cl. 296-146.000.
Ringwall, Carl G.: *See*—
Haefner, Kenneth B.; and Ringwall, Carl G., 4,085,615, Cl. 73-194.00B.
Rite Autotronics Corporation: *See*—
Schwartz, Edwin L., 4,085,611, Cl. 73-115.000.
Ritsema, Irving Ray; and Turak, John Lewallen, to Bendix Corporation, The. Brake wear indicator. 4,085,826, Cl. 188-1.00A.
Ritter, Ernst: *See*—
Djordjevic, Ilija; Jaenke, Hans-Jurgen; Ritter, Ernst; and Staudt, Heinrich, 4,085,724, Cl. 123-140.0MC.
Robandt, William F.; Cartier, Roger J.; and Gay, Sandy C., to Whirlpool Corporation. Coil assembly structure. 4,086,553, Cl. 336-192.000.
Robbins, Medford Dwight: *See*—
Peterson, Donald John; and Robbins, Medford Dwight, 4,086,280, Cl. 260-617.00R.
Robbins, Theodore W.; and Terry, Raymond O., Jr., to Western Electric Company, Inc. Switchable attenuator assembly and method of assembling same. 4,086,548, Cl. 333-81.00R.
Robbins, Theodore W.: *See*—
Fulp, William W.; Nance, Jack G.; Owens, James L.; and Robbins, Theodore W., 4,086,546, Cl. 333-81.00R.
Nance, Jack G.; Owens, James L.; and Robbins, Theodore W., 4,086,547, Cl. 333-81.00R.
Roberson, Cletis L., to Owens-Corning Fiberglas Corporation. Apparatus for advancing a linear fibrous element. 4,085,881, Cl. 226-95.000.
Robert Bosch GmbH: *See*—
Djordjevic, Ilija; Jaenke, Hans-Jurgen; Ritter, Ernst; and Staudt, Heinrich, 4,085,724, Cl. 123-140.0MC.
Roberts, George. Ventilated toilet device. 4,085,470, Cl. 4-213.000.
Roberts, James L.: *See*—
Robinson, William R.; and Roberts, James L., 4,086,018, Cl. 408-226.000.
Roberts, Joseph A.: *See*—
Ostman, Barry I.; and Roberts, Joseph A., 4,085,502, Cl. 29-629.000.
Robertshaw Controls Company: *See*—
Branson, Charles D.; and Demi, Roy C., 4,085,891, Cl. 236-15.00A.
Steele, Everett T., Jr., 4,085,775, Cl. 137-625.500.
Robins Industries Corporation: *See*—
Post, Herman D.; Perper, Edward; and Alexandrovich, George, Sr., 4,085,926, Cl. 269-295.000.
Robinson, Aaron Z.: *See*—
Johnston, Thomas F.; and Robinson, Aaron Z., 4,086,560, Cl. 340-3.00R.
Robinson, Ronald Charles, to Northern Telecom Limited. Telephone handset transmitter with improved output response. 4,086,445, Cl. 179-121.00R.
Robinson Tool Company: *See*—
Robinson, William R.; and Roberts, James L., 4,086,018, Cl. 408-226.000.
Robinson, William F.: *See*—
Fillmore, Gary L.; Hill, James D.; Robinson, William F.; and Williams, Thomas H., 4,086,601, Cl. 346-75.000.
Robinson, William J.; and Martin, Harold G., to Sundstrand Corporation. Actuator system for dual path transmission. 4,085,812, Cl. 180-6.480.
Robinson, William R.; and Roberts, James L., to Robinson Tool Company. Deburring tool. 4,086,018, Cl. 408-226.000.
Rockwell International Corporation: *See*—
Brown, James L., 4,086,656, Cl. 364-733.000.
Chelikowsky, Richard D.; and Stinson, Kenneth R., 4,086,593, Cl. 343-106.00R.
LaChapelle, Theodore J., Jr.; Davis, John R.; and Licari, James J., 4,086,375, Cl. 427-90.000.
Scarborough, William M., 4,085,825, Cl. 188-1.00B.
Roesler, Frank Cornelius, to Imperial Chemical Industries Limited. Treatment of solids-liquid-gas mixtures. 4,086,160, Cl. 210-7.000.
Roger, Harry. Valve assembly. 4,085,772, Cl. 137-464.000.
Rohde, Wolfgang: *See*—
Echterhoff, Heinrich; Simonis, Wolfgang; Rohde, Wolfgang; and Beck, Kurt-Gunther, 4,086,143, Cl. 201-41.000.
Rohm and Haas Company: *See*—
Carty, Daniel T.; and Oline, James A., 4,086,296, Cl. 260-857.00G.
Hurt, William S., 4,086,337, Cl. 424-215.000.
Owen, Ronald P.; Miller, George A.; and Schneider, Charles M., 4,086,336, Cl. 424-204.000.
Owens, Frederick H.; and Clovis, James S., 4,086,300, Cl. 260-885.000.
Roland, Murray C.; and Norum, Edward M., to Lockwood Corporation. Outdoor motor enclosure. 4,086,507, Cl. 310-88.000.
Rolls-Royce Limited: *See*—
Freeman, Christopher; and Moritz, Robert Rudolph, 4,086,022, Cl. 415-119.000.
Slattery, Sidney Edward, 4,085,580, Cl. 60-39.650.
Rolls-Royce Motors Limited: *See*—
Walker, David Richard William, 4,086,178, Cl. 252-143.000.
Rondanelli, Alfredo: *See*—
Gozzo, Franco; Rondanelli, Alfredo; and Rossi, Giorgio, 4,086,226, Cl. 260-239.0BF.
Rontex America, Inc.: *See*—
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Roper Corporation: *See*—
Kromm, David C.; and Znamirowski, Henry, 4,085,480, Cl. 16-94.00D.
Roquemore, William D.: *See*—
Jackson, Jimmy; and Roquemore, William D., 4,085,633, Cl. 81-111.000.
Rosinski, Edward J.: *See*—
Rubin, Mae K.; Rosinski, Edward J.; and Plank, Charles J., 4,086,186, Cl. 252-430.000.
Rossetti, Vittorio: *See*—
Marsili, Leonardo; Rossetti, Vittorio; and Pasqualucci, Carmine, 4,086,225, Cl. 260-239.30P.
Rossi, Giorgio: *See*—
Gozzo, Franco; Rondanelli, Alfredo; and Rossi, Giorgio, 4,086,226, Cl. 260-239.0BF.
Rotgans, Gerrit Jacob, to Gould Godart B.V. Apparatus for effecting plethysmography. 4,085,741, Cl. 128-2.080.
Roth, Gerd: *See*—
Axer, Heinrich; and Roth, Gerd, 4,086,313, Cl. 264-70.000.
Rowland, Stanley P., to United States of America, Agriculture. Flame retarded textiles via deposition of polymers from oligomeric vinylphosphonate and polyamino compounds. 4,086,385, Cl. 428-272.000.
Rowley, James R., to PPG Industries, Inc. Shipping rack having spacer strips attached thereto. 4,086,263, Cl. 206-454.000.
Royal Industries, Inc.: *See*—
Shapiro, Haskell; and DeCaro, Robert E., 4,085,619, Cl. 73-462.000.
Rozhkov, Alexandr Timofeevich: *See*—
Deribas, Andrei Andreevich; Demchuk, Alexandr Fedorovich; Braunshtein, Rudolf Aronovich; Bochkarev, Boris Nikolaevich; Viktorov, Vladimir Borisovich; Karkishko, Gennady Semenovich; Baranov, Sergei Vasilievich; Prakhov, Alexandr Ivanovich; Kasatkin, Vladimir Semenovich; and Rozhkov, Alexandr Timofeevich, 4,085,883, Cl. 228-2.500.
RP Industries, Inc.: *See*—
Rich, Stanley R.; and Pantazelos, Theophanes G., 4,086,152, Cl. 204-176.000.
Rubin, Mae K.; Rosinski, Edward J.; and Plank, Charles J., to Mobil Oil Corporation. Crystalline zeolite ZSM-34 and method of preparing the same. 4,086,186, Cl. 252-430.000.
Ruckdeschel, Frederick R.: *See*—
Hauser, Oscar G.; and Ruckdeschel, Frederick R., 4,086,006, Cl. 355-3.0DD.
Ruff, Stanley L. Insulating drink-through closure lids for potable open-top containers. 4,085,861, Cl. 220-90.400.
Rundell, Herbert A., to Texaco Inc. Heavy duty torque coupling. 4,085,612, Cl. 73-136.00A.
Runkel, Albert: *See*—
Thiel, Alfons W.; Martini, Hans; Wolf, Peter; and Runkel, Albert, 4,085,517, Cl. 34-21.000.
Runnels, John H.: *See*—
Engle, Charles J.; and Runnels, John H., 4,085,800, Cl. 166-288.000.
Rupp, Roland: *See*—
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,086,346, Cl. 424-253.000.
Rush-Hampton Industries: *See*—
Frazier, Stephen E., 4,085,704, Cl. 119-1.000.
Ryan, Kenneth J.: *See*—
Acton, Edward M.; and Ryan, Kenneth J., 4,086,416, Cl. 536-24.000.
Rydborn, Sten-Ake. Apparatus for the optional detection of the movement of any individual or any optional pair of objects. 4,086,575, Cl. 340-259.000.
Ryland, Garnett, II: *See*—
Buckley, William H.; and Ryland, Garnett, II, 4,086,012, Cl. 403-2.000.
Ryon, Donald Carroll, to Motorola, Inc. Instantly retunable tone generator for an electronic musical instrument. 4,085,645, Cl. 84-1.010.
Safe Rack, Inc.: *See*—
Gordon, Roger G., 4,085,864, Cl. 221-155.000.
Safford, George J.: *See*—
Davis, Thomas G.; and Safford, George J., 4,086,650, Cl. 361-229.000.
Sagami Chemical Research Center: *See*—
Tsuchihashi, Genichi; and Ogura, Katsuyuki, 4,086,420, Cl. 542-413.000.
Saido, Shuichi: *See*—
Mitani, Seishu; Kudo, Tsuneo; Mitani, Minoru; and Saido, Shuichi, 4,086,390, Cl. 428-550.000.
Saito, Shoichi, to Olympus Optical Co., Ltd. Device for fitting a magnetic head of a tape recorder. 4,086,638, Cl. 360-109.000.
Saito, Shozo; and Inoue, Naoyuki, to Ebara Manufacturing Co., Ltd. Double effect absorption refrigerating system. 4,085,595, Cl. 62-476.000.
Saito, Toranosuke; Kitani, Masakatu; Mori, Kenshi; and Izawa, Shinichi, to Sanko Kaihatsu Kagaku Kenkyosho; and Asahi-Dow Limited. Organophosphorus compounds and process for the production thereof. 4,086,206, Cl. 260-45.8NT.
Saitou, Sinichi, to Olympus Optical Co., Ltd. Recording and reproducing apparatus with tape seed dependent on head selection. 4,086,635, Cl. 360-73.000.

Sakaguchi, Keiichi: *See*—
Ishikawa, Kazuo; Sakaguchi, Keiichi; Takigawa, Tomoshi; Hirata, Noritsugu; Tajima, Akira; and Tsuji, Sadahiko, 4,086,605, Cl. 354-270.000.

Sakakibara, Shumpei; Morikawa, Tadanori; Munekata, Eisuke; Kimura, Terutoshi; Nakagawa, Yasuo; and Noda, Toshiharu, to Toyo Jozo Kabushiki Kaisha. Polypeptides and process for producing the same. 4,086,221, Cl. 260-112.5ST.

Sakuma, Fumio: *See*—
Soeda, Katsuji; Sakuma, Fumio; and Oyama, Mitsuhiro, 4,085,692, Cl. 112-275.000.

Sakurada, Nobuaki: *See*—
Ito, Fumio; Ito, Tadashi; Mashimo, Yukio; Sakurada, Nobuaki; and Shinoda, Nobuhiko, 4,086,581, Cl. 354-23.00D.

Sakurai, Yoshio: *See*—
Ishida, Torao; Akiyama, Minoru; Sakurai, Yoshio; and Tsukagoshi, Shigeru, 4,086,417, Cl. 536-29.000.

Salle, Donald A. Pen shaking device. 4,085,955, Cl. 366-212.000.

Saltich, Jack L.: *See*—
Clark, Lowell E.; and Saltich, Jack L., 4,086,610, Cl. 357-34.000.

Salzano, Francis J.: *See*—
Powell, James R.; and Salzano, Francis J., 4,085,590, Cl. 60-673.000.

Samokovliski, David Albert; Grozdanov, Petko Kostadinov; Nemechek, Alfred Emmerich; Punchev, Simeon Georgiev; and Petrov, Peter Dimitrov, to Institute po Zavaryavane. Device for planetary electrode wire-feeding having automatic adjusting means for the pushing force exerted on the electrode wire. 4,085,880, Cl. 226-90.000.

Sampson, Richard L.: *See*—
Severson, Asbjorn M.; and Sampson, Richard L., 4,085,730, Cl. 126-270.000.

Sams, Marvin W. Electroencephalograph cap and electrode harness. 4,085,739, Cl. 128-2.10B.

Sanada, Noriaki: *See*—
Kiyohara, Takehiko; Tsunekawa, Tokuichi; Yazaki, Mutsunobu; Sanada, Noriaki; Taguchi, Tetsuya; and Nakamura, Zenzo, 4,086,582, Cl. 354-33.000.

Sanders, James E., to Owens-Corning Fiberglas Corporation. Apparatus for packaging linear material. 4,085,901, Cl. 242-18.00G.

Sandoz, Inc.: *See*—
Nadelson, Jeffrey, 4,086,243, Cl. 260-325.0PH.
Nadelson, Jeffrey, 4,086,421, Cl. 544-127.000.

Sandoz Ltd.: *See*—
Kleinlogel, Horst, 4,086,342, Cl. 424-250.000.
Neumann, Peter, 4,086,353, Cl. 424-272.000.

Sanitation Equipment Limited: *See*—
Stewart, John M., 4,086,037, Cl. 417-571.000.

Sanko Kaihatsu Kagaku Kenkyosho: *See*—
Saito, Toranosuke; Kitani, Masakatu; Mori, Kenshi; and Izawa, Shinichi, 4,086,206, Cl. 260-45.8NT.

Sant' Andrea Novara Officine Meccaniche e Fonderie S.p.A.: *See*—
Marcio', Pietro, 4,085,900, Cl. 242-18.0DD.

Sargent Industries, Inc.: *See*—
Smith, Fred T., 4,085,857, Cl. 214-302.000.
Smith, Fred T., 4,085,858, Cl. 214-303.000.

Sartorius-Werke GmbH und. vorm. Goettinger Praezisionswaagenfabrik GmbH: *See*—
Knothe, Erich; Berg, Christoph; and Stadler, Eberhard, 4,085,811, Cl. 177-210.0EM.

Sarver, John J. Rearwardly controlled snow skis. 4,085,947, Cl. 280-607.000.

Sasaki, Isao, to Nittan Company. Alarm control device. 4,086,573, Cl. 340-213.00R.

Sasaki, Kazuo: *See*—
Yoshida, Mitsuo; Furukawa, Wataru; Yamaguchi, Takashi; and Sasaki, Kazuo, 4,085,942, Cl. 277-30.000.

Sase, Takashi: *See*—
Katou, Kazuo; Sase, Takashi; and Horinaka, Ikuho, 4,086,541, Cl. 330-51.000.

Sasse, Wolfgang Hermann Fritz: *See*—
Jackson, Mervyn Benjamin; and Sasse, Wolfgang Hermann Fritz, 4,086,299, Cl. 260-885.000.

Sathe, Hemant T.: *See*—
Gauss, Robert C.; Sathe, Hemant T.; and Wills, Lynn D., 4,086,596, Cl. 343-715.000.

Sato, Hiroshi: *See*—
Kojima, Ichiro; Sato, Hiroshi; and Fujiwara, Yasuo, 4,086,138, Cl. 195-65.000.

Sato, Masanari: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Kurita, Hideaki; Ichikawa, Tetsuya; Sato, Masanari; and Mori, Kaoru, 4,086,136, Cl. 195-29.000.

Sato, Sadaharu: *See*—
Yoshikawa, Naohiro; Sato, Sadaharu; Matsubara, Masanori; and Hosoda, Masao, 4,085,675, Cl. 101-269.000.

Satron, Inc.: *See*—
McLennan, Richard Earl; and Looker, Robert, 4,085,684, Cl. 105-482.000.

Satterlee, Adelbert E.: *See*—
Meuschke, Robert E.; and Satterlee, Adelbert E., 4,086,132, Cl. 176-30.000.

Sattler, Robert I., to LaSalle Machine Tool, Inc. Cam and cam follower assembly. 4,085,634, Cl. 82-19.000.

Saucy, Gabriel: *See*—
Chan, Ka-Kong; and Saucy, Gabriel, 4,086,249, Cl. 260-345.500.

Sauder, Kenneth D. Nonpickable lock. 4,085,601, Cl. 70-364.00R.

Saufferer, Helmut: *See*—
Willmann, Karl; and Saufferer, Helmut, 4,085,717, Cl. 123-119.00E.

Savarimuthu, Sundar. Hydraulic engine piston. 4,085,710, Cl. 123-19.000.

Sawada, Hideo: *See*—
Toyoshima, Iwao; Ishii, Kunio; Sawada, Hideo; Kawamoto, Junji; and Yokota, Hiromu, 4,085,760, Cl. 131-268.000.

Sawai, Tsukasa: *See*—
Sugio, Akitoshi; Masuda, Yukiya; Kobayashi, Toshihiko; Nakano, Koichi; and Sawai, Tsukasa, 4,086,128, Cl. 156-668.000.

Sawyer, Gerry Dun: *See*—
Speiser, Maxmilian Richard; Eng, Don; and Sawyer, Gerry Dun, 4,086,630, Cl. 364-410.000.

Scarborough, William M., to Rockwell International Corporation. Vibratory system isolation and flexure pivot. 4,085,825, Cl. 188-1.00B.

Schaal, Christian, to Daimler-Benz Aktiengesellschaft. Exhaust gas return system for auto-igniting internal combustion engines. 4,085,718, Cl. 123-119.00A.

Scharlack, Ronald S. Automatic heater controller. 4,086,466, Cl. 219-494.000.

Scheffler, Friedrich; and Stangl, Ernst, to AEG-Elotherm G.m.b.H. Induction heating system for the continuous flow heating of workpieces. 4,086,462, Cl. 219-10.710.

Scheidel, Fritz, to Siemens Aktiengesellschaft. Coating for passivating a semiconductor device. 4,086,614, Cl. 357-54.000.

Scheinecker, Alois; Koller, Karl; and Holleis, Gunter, to Vereinigte Osterreichische Eisen- und Stahlwerke - Alpine Montan Aktiengesellschaft. Plate mould having two tiltably adjustable end walls. 4,085,793, Cl. 164-436.000.

Scheithauer, Eric A.: *See*—
Hines, William; Scheithauer, Eric A.; and Cwirzen, Casimir, 4,086,648, Cl. 361-124.000.

Schellmann, Erhard: *See*—
Bocker, Ernst; Krachi, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,086,346, Cl. 424-253.000.

Schenk, Bernard H., to Hugh J. McLaughlin & Son, Inc. Composition for a floater golf ball and the floater golf ball made therefrom. 4,085,937, Cl. 273-218.000.

Schermacher, Ken Stephen: *See*—
Cheshire, David Alan; Debbas, Samir Costandi; Eger, Richard Thomas; Schermacher, Ken Stephen; and Twohig, Paul Thomas, 4,086,381, Cl. 428-113.000.

Schick, Rupert: *See*—
Hinselmann, Klaus; Penzien, Klaus; Schick, Rupert; Walter, Manfred; Weber, Heinz; and Wirth, Heinrich, 4,086,191, Cl. 260-2.50B.

Schilling, Karl; and Rathert, Horst, to Werftunion G.m.b.H. & Co. Dual rudder assembly. 4,085,694, Cl. 114-163.000.

Schindler, Hans Rudolf; and Vettiger, Peter, to International Business Machines Corporation. Electronic hybrid circuit for connecting a two-wire line to switching system. 4,086,447, Cl. 179-170.0NC.

Schirutschke, Rudolf: *See*—
Borowski, Eva; Braun, Klaus; Breuel, Klaus; Dauth, Christoph; Erge, Dieter; Grawert, Werner; Groger, Detlev; Hohne, Liselotte; Knothe, Edda; Muller, Monika; Nordmann, Gisela; Schirutschke, Rudolf; and Volzke, Klaus-Dieter, 4,086,141, Cl. 195-81.000.

Schlapp, Albert, to American Sunroof Manufacturing Company. Sliding roofs for automobiles. 4,085,965, Cl. 296-137.00F.

Schlatter, James M., to G. D. Searle & Co. Fragments of secretin. 4,086,220, Cl. 260-112.50R.

Schlumberger Technology Corporation: *See*—
Schweitzer, Jeffrey S.; and Tapphorn, Ralph M., 4,085,798, Cl. 166-252.000.

Schmandt, Gary M.: *See*—
Finn, Lawrence R.; McCartan, Daniel A.; and Schmandt, Gary M., 4,085,562, Cl. 53-59.00R.

Schmidt-Dunker, Manfred; and Potokar, Matthias, to Henkel Kommanditgesellschaft Auf Aktien. Composition and method for the treatment of disorders of calcium metabolism. 4,086,334, Cl. 424-177.000.

Schmidt, Michael P.: *See*—
Anderson, Leroy E.; Schmidt, Michael P.; and Weaver, William W., 4,085,604, Cl. 72-50.000.

Schmidt, Roger N., to Honeywell Inc. Solar air heater. 4,085,729, Cl. 126-270.000.

Schmit, Joseph Lawrence: *See*—
Johnson, Eric Shanks; and Schmit, Joseph Lawrence, 4,086,106, Cl. 148-33.000.

Schmitt, James F.: *See*—
Kast, Philip J.; and Schmitt, James F., 4,085,821, Cl. 184-15.00A.

Schmitter, Hans-Jurgen: *See*—
Lehn, F. Heinrich; and Schmitter, Hans-Jurgen, 4,085,507, Cl. 32-17.000.

Schneider, Abraham; Ware, Richard E.; and Janoski, Edward J., to Suntech, Inc. Isomerization of endo-tetrahydrodicyclopentadiene to a missile fuel diluent. 4,086,284, Cl. 260-666.0PY.

Schneider, Abraham: *See*—
Janoski, Edward J.; Schneider, Abraham; and Ware, Richard E., 4,086,286, Cl. 260-666.0PY.

Schneider, Alvin F., to Alpha Metals, Inc. Improved cleaning solvent containing non-azeotropic mixtures of 1,1,1-trichloroethane and n-propanol. 4,086,179, Cl. 252-171.000.

Schneider, Charles M.: *See*—
Owen, Ronald P.; Miller, George A.; and Schneider, Charles M., 4,086,336, Cl. 424-204.000.
Schneider, Louis; and Graham, David E., to GAF Corporation. Fungicidal-N-(3-halo-2,6-dinitro-4-trifluoromethylphenyl)-pyrrolidones. 4,086,356, Cl. 424-274.000.
Schneider, Louis; and Graham, David E., to GAF Corporation. Fungicidal 2,6-dinitrodiphenylethers. 4,086,364, Cl. 424-340.000.
Schneider, Rolf: *See*—
Laux, Walter; Hebel, Rudolf; and Schneider, Rolf, 4,086,052, Cl. 432-217.000.
Schorter, Bruno, to U.S. Philips Corporation. Automotive electronic flasher unit. 4,086,565, Cl. 340-81.00R.
Schorter, Bruno: *See*—
Ricouard, Jean-Pierre; and Schorter, Bruno, 4,086,533, Cl. 324-208.000.
Schriefl, Karl-Ekkehard: *See*—
Joschko, Gunter; and Schriefl, Karl-Ekkehard, 4,085,939, Cl. 274-1.00R.
Schriever, William W., to Meyer, Edward D. Double wedge-lock cylinder head. 4,085,661, Cl. 92-170.000.
Schrock, Wilfried; Konig, Hans-Bodo; Preiss, Michael; Metzger, Karl Georg; and Walkowiak, Michael, to Bayer Aktiengesellschaft. Cephalosporins and their production. 4,086,340, Cl. 424-246.000.
Schroeder, Rondon L. Digital altitude encoder. 4,086,580, Cl. 340-347.00P.
Schuhmann, Reinhardt, Jr.: *See*—
Queneau, Paul E.; and Schuhmann, Reinhardt, Jr., 4,085,923, Cl. 266-215.000.
Schulz, Johann G.: *See*—
Onopchenko, Anatoli; and Schulz, Johann G., 4,086,277, Cl. 260-591.000.
Schumacher, Ignatius: *See*—
Morgan, Albert W.; Schumacher, Ignatius; and Vanderlinde, William, 4,086,302, Cl. 260-926.000.
Schwartz, Edwin L., to Rite Autotronics Corporation. Recording compression testing meter. 4,085,611, Cl. 73-115.000.
Schwarz, Alois: *See*—
Weiland, Emil; Schwarz, Alois; Mautz, Karl-Heinz; and Frommlet, Hubert, 4,086,024, Cl. 416-140.000.
Schweinsberg, Dieter Klaus-Jurgen, to Eichner Organisation KG. Data carrier holder. 4,085,535, Cl. 40-124.200.
Schweinsberg, Dieter Klaus-Jurgen: *See*—
Eckstein, Werner Willi Gustav; and Schweinsberg, Dieter Klaus-Jurgen, 4,085,534, Cl. 40-124.200.
Schweitzer, Edmund O., Jr. Fault indicator and means for resetting the same. 4,086,529, Cl. 324-127.000.
Schweitzer, Jeffrey S.; and Tapphorn, Ralph M., to Schlumberger Technology Corporation. Method for investigating the front profile during flooding of formations. 4,085,798, Cl. 166-252.000.
Schweitzer, Judith J. Knapsack with integral storage and carrying pouch. 4,085,873, Cl. 224-8.00R.
Science Union et Cie., Societe Francaise de Recherche Medicale: *See*—
Vincent, Michel; Remond, Georges; and Poignant, Jean-Claude, 4,086,355, Cl. 424-274.000.
SCM Corporation: *See*—
Markakis, Michael J., 4,085,836, Cl. 197-19.000.
Scott, M. Walter: *See*—
Hager, Robert J.; Johnson, Eric S.; Scott, M. Walter; and Stelzer, Ernest L., 4,085,500, Cl. 29-589.000.
Scriabine, Alexander, to Merck & Co., Inc. Novel anti-hypertensive compositions. 4,086,354, Cl. 424-273.00R.
Scrivo, Leonard; and Goldstein, Sidney, to Vicon Products Corporation. Eye glasses. 4,086,004, Cl. 351-158.000.
Sears, Barry D. Phosphatidyl quaternary ammonium compounds. 4,086,257, Cl. 260-403.000.
Sears, Charles L.: *See*—
Horine, James H.; Watts, Lowell K.; Wininger, Hershel R.; Kelley, Dale; and Sears, Charles L., 4,085,552, Cl. 51-166.00R.
Sega, Kenji: *See*—
Suzuki, Osamu; Oishi, Kengo; Akashi, Goro; and Sega, Kenji, 4,085,907, Cl. 242-199.000.
Seibert, Walter; Riedel, Guenther; and Mayer, Kurt, to BASF Aktiengesellschaft. Concentrated storage-stable solutions of alkylbenzenesulfonates of basic dyes. 4,086,054, Cl. 8-89.00R.
Seiderman, Abe. Cushioned toilet seat assembly. 4,085,468, Cl. 4-237.000.
Seiford, Robert R. Mechanical locking device for a longitudinally split bottom dump barge. 4,085,693, Cl. 114-29.000.
Seiko-Seiki Kabushiki Kaisha: *See*—
Sugita, Terumitsu, 4,085,554, Cl. 51-325.000.
Seiler, Erhard: *See*—
Fahrbach, Gerhard; Gerberding, Karl; Seiler, Erhard; and Stein, Dieter, 4,086,298, Cl. 260-880.00B.
Seitzer, Walter H., to Sun Oil Company of Pennsylvania. Manufacture of xylenes. 4,086,289, Cl. 260-671.00M.
Sellars, Lester Porter: *See*—
Foxall, Thomas George; Ibrahim, Abd-El-Fattah Ali; and Sellars, Lester Porter, 4,086,609, Cl. 357-24.000.
Selsam, Roger L.: *See*—
Bouyoucos, John V.; Behnfeldt, Marvin J.; and Selsam, Roger L., 4,086,122, Cl. 156-556.000.
Semiconductor Research Foundation: *See*—
Nishizawa, Jun-ichi; Nakamura, Kentaro; and Kitsuregawa, Takashi, 4,086,611, Cl. 357-38.000.
Senoo, Masao: *See*—
Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, 4,086,209, Cl. 260-49.000.
Seragnoli, Enzo, to G. D. Societa per Azioni. Device for preparing pieces of wrapping material for use as the inner wrap in hinge lid cigarette packs. 4,085,569, Cl. 53-389.000.
Seragnoli, Enzo, to G. D. Societa Per Azioni. Automatic apparatus for transferring cigarette containers from devices arranged to fill such containers to hopper loading mechanisms in packaging machines for forming packets of cigarettes. 4,085,759, Cl. 131-25.000.
Sergot, Joseph, to Prorea S.A. Method for simultaneously concentrating and purifying phosphoric acid. 4,086,069, Cl. 55-48.000.
Serini, Volker: *See*—
Bottenbruch, Ludwig; Kampf, Gunther; Serini, Volker; and Vernaleken, Hugo, 4,086,310, Cl. 264-41.000.
Serpas, Luis B.; Small, Sam W.; and Ellers, Frederick S., to Bechtel International Corporation. Materials delivery system for offshore terminal and the like. 4,085,781, Cl. 141-1.000.
Severson, Asbjorn M.; and Sampson, Richard L., to Honeywell Inc. Solar air heater. 4,085,730, Cl. 126-270.000.
Seward, Thomas Philip, III; and Wedding, Brent Merle, to Corning Glass Works. Method for producing tri-color screens for television picture tubes. 4,086,089, Cl. 96-27.00R.
Sexton, Arthur R.: *See*—
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., 4,086,151, Cl. 204-159.160.
Sgourakes, George E.: *See*—
Curran, John R.; Sgourakes, George E.; and Richardson, David A., 4,085,614, Cl. 73-194.0VS.
Shakespeare Company: *See*—
McLain, Philippe Hardy-The; and Shepherd, Bob Gene, 4,085,574, Cl. 57-68.000.
Shanbrom, Edward; and Bishop, Robert C., to Edward Shanbrom, Inc. Method of preserving blood plasma II. 4,086,218, Cl. 260-112.00B.
Shapiro, Haskell; and DeCaro, Robert E., to Royal Industries, Inc. Electronic balancer for vehicle wheels. 4,085,619, Cl. 73-462.000.
Sharp Kabushiki Kaisha: *See*—
Takano, Rikuo; Ohta, Yutaka; Sumitomo, Yuji; Shimazawa, Yoichi; and Aiba, Masahiko, 4,085,837, Cl. 197-133.00R.
Tanimoto, Akira; and Nishimura, Kosuke, 4,086,655, Cl. 364-705.000.
Sharpe, Thomas H. Impaction/induction jet engine. 4,085,585, Cl. 60-262.000.
Sharples, Thomas D., to Beckman Instruments, Inc. Flexible stem valve. 4,085,952, Cl. 251-298.000.
Shaw, Bryan; Lawton, Valerie; and McAinsh, James, to Imperial Chemical Industries Limited. Fibers sized with polyester and polyurethane precursors. 4,086,203, Cl. 260-40.00R.
Shaw, David N., to Dunham-Bush, Inc. Air source heat pump with multiple slide rotary screw compressor/expander. 4,086,072, Cl. 62-2.000.
Shaw, Hugh E., Jr.: *See*—
Cherenko, Joseph P.; and Shaw, Hugh E., Jr., 4,086,595, Cl. 343-713.000.
Shell Oil Company: *See*—
Kravetz, Louis N.; and Kubitschek, Hans E., 4,086,175, Cl. 252-99.000.
Kubitschek, Hans E.; and Kravetz, Louis, 4,086,177, Cl. 252-102.000.
Wattimena, Freddy, 4,086,282, Cl. 260-621.00H.
Wood, Donald L.; Moore, Robert J.; and Rhodes, Robert B., 4,086,171, Cl. 252-33.000.
Shenfield, Leonard R.: *See*—
Cizmic, Stipe; Edwards, Wayne L., Jr.; Jacques, James O.; Mahon, Douglas K.; and Shenfield, Leonard R., 4,086,636, Cl. 360-75.000.
Cizmic, Stipe; Edwards, Wayne L., Jr.; Griffith, David L.; Halfhill, Martin O.; Jacques, James O.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,086,659, Cl. 364-900.000.
Shephard, Margaret Claire: *See*—
Balasubramanyan, Sugavanam; and Shephard, Margaret Claire, 4,086,351, Cl. 424-269.000.
Shepherd, Bob Gene: *See*—
McLain, Philippe Hardy-The; and Shepherd, Bob Gene, 4,085,574, Cl. 57-68.000.
Sherk, Fred T.: *See*—
Irvin, Howard B.; Sherk, Fred T.; and Hoffman, Alfred A., Jr., 4,086,288, Cl. 260-671.00R.
Sherman, Clarence A., to McDermid, Terry. Tilting cab latch mechanism. 4,085,960, Cl. 296-28.00C.
Sherwood Medical Industries Inc.: *See*—
Dodge, Larry H., 4,085,751, Cl. 128-275.000.
Shiba, Keisuke; Hirose, Takeshi; Inouye, Kozo; and Okumura, Akio, to Fuji Photo Film Co., Ltd. Photographic couplers with N-heterocyclic development inhibiting coupling-off group. 4,086,094, Cl. 96-100.00R.
Shibata, Norio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Secondary air supply system for internal combustion engines. 4,085,586, Cl. 60-277.000.
Shibata, Seiji: *See*—
Honda, Tetsuya; Yagi, Kiyoshi; Shibata, Seiji; and Yamaguchi, Kazuo, 4,086,189, Cl. 252-519.000.
Shibata, Toshiji; and Fujiwara, Shinji, to Meisei Electric Co. Ltd. Microwave oscillator. 4,086,535, Cl. 325-128.000.
Shibuya, Tsunenori; and Kondo, Hiroshi, to Diesel Kiki Co., Ltd.

Rotary compressor comprising improved rotor lubrication system. 4,086,040, Cl. 418-76.000.
Shimanuki, Fujio: *See—*
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Shimazawa, Yoichi: *See—*
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Shimizu, Kazuaki, to Nissan Motor Co., Ltd. Disc brake. 4,085,829, Cl. 188-72.500.
Shimokawa, Yoichi: *See—*
Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, 4,086,093, Cl. 96-86.00P.
Kurihara, Masaru; Tokizane, Soichi; Tanaka, Tatsundo; Tanimura, Masamitsu; and Shimokawa, Yoichi, 4,086,215, Cl. 260-78.00R.
Shinoda, Nobuhiko: *See—*
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Shirahata, Ryuji: *See—*
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Shirai, Isoo; Suzuki, Takeshi; and Takahashi, Tsutomu, to Chisso Corporation. Process for activating catalyst for polymerization of propylene before polymerization. 4,086,185, Cl. 252-429.00B.
Shorter, Myron L., Jr. Utility chase for floating units. 4,085,696, Cl. 114-266.000.
Shrive, Nigel Graham: *See—*
Goodfellow, John William; O'Connor, John Joseph; and Shrive, Nigel Graham, 4,085,466, Cl. 3-1.910.
Siebelink, Johannes Willem: *See—*
Franssen, Nico Valentinus; Kuijk, Karel Elbert; and Siebelink, Johannes Willem, 4,086,431, Cl. 179-1.0SA.
Sieberer, Karl-Heinz: *See—*
Koziol, Konrad; Sieberer, Karl-Heinz; and Rathjen, Hans-Carl, 4,086,157, Cl. 204-290.00F.
Sieder, Wolfgang, to Daimler-Benz Aktiengesellschaft. Strain gauge. 4,086,554, Cl. 338-2.000.
Siemens Aktiengesellschaft: *See—*
Haass, Adolf, 4,086,428, Cl. 178-60.000.
Jurgens, Wolfgang; Nageler, Jorg; Lippitsch, Josef; and Holzner, Julius, 4,086,308, Cl. 261-124.000.
Koubek, Michael, 4,086,615, Cl. 358-32.000.
Koubek, Michael, 4,086,618, Cl. 358-166.000.
Krumrey, Guenter; and Stoeckl, Wilhelm, 4,086,493, Cl. 250-468.000.
Scheidel, Fritz, 4,086,614, Cl. 357-54.000.
Voss, Peter, 4,086,612, Cl. 357-38.000.
Vukasovic, Lovro, 4,086,621, Cl. 363-37.000.
Vukasovic, Lovro, 4,086,622, Cl. 363-37.000.
Sifferman, Thomas R.; and Sparlin, Derry D., to Continental Oil Company. Control of incompetent formations with thickened acid-settable resin compositions. 4,085,801, Cl. 166-295.000.
Sifferman, Thomas R.; and Sparlin, Derry D., to Continental Oil Company. Use of thickened oil for sand control processes. 4,085,802, Cl. 166-295.000.
Sikora, Harald. Apparatus for the measurement of the wall thickness of coated rod with consideration of eccentricity. 4,086,044, Cl. 425-113.000.
Sikora, Harald, to Harald Sikora Sikora Industrieelektronik. Apparatus for controlling the laying of strip material. 4,086,472, Cl. 235-92.0DN.
Silberman, Louis B.: *See—*
Solomon, Irvine J.; and Silberman, Louis B., 4,086,228, Cl. 260-239.0HM.
Silver, Louis J. Scouring device. 4,085,475, Cl. 15-209.00D.
Silver Seiko Co., Ltd.: *See—*
Kamikura, Shigeo; Itagaki, Hideaki; Kagaya, Yutaka; and Kawaoka, Ryoiti, 4,085,597, Cl. 66-75.200.
Silvestri, Anthony J.: *See—*
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Simond, Jacques: *See—*
Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; Simond, Jacques; and Monteil, Andre, 4,086,352, Cl. 424-270.000.
Simonis, Wolfgang: *See—*
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Simonoff, Ely, to Opelika Manufacturing Corporation. Double oven mitt. 4,085,464, Cl. 2-158.000.
Simplot, J. R.: *See—*
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Singer Company, The: *See—*
Coughenour, Donald Jay; and Brown, Jack, 4,085,691, Cl. 112-158.00E.
Ljung, Bo Hans Gunnar, 4,085,982, Cl. 308-76.000.
Meyer, Jerome W., 4,085,524, Cl. 35-10.400.
Papajewski, Reinhold, 4,085,690, Cl. 112-158.00R.
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Lesher, George Y.; and Singh, Baldev, 4,086,233, Cl. 260-256.40C.
Sinsky, Allen I.; Wang, Paul C.; and Willey, Robert E., to Bendix Corporation, The. Continuous line scanning technique and means for beam port antennas. 4,086,597, Cl. 343-754.000.
Siwiak, Kazimierz; and Moran, Robert L., to Raytheon Company. Small aperture antenna. 4,086,591, Cl. 343-18.00A.
Skarheim, Hans Petter; and Damhaug, Torbjorn, to Thune-Eureka A/S. Lamella separator for sedimenting (gravity separating). 4,086,169, Cl. 210-519.000.
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Skutley, Kale Franklin: *See—*
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Slater Electric Inc.: *See—*
Slater, Thomas S.; and Jadatz, Harald B., 4,086,549, Cl. 335-18.000.
Slater, Saul I. Convertible airship. 4,085,912, Cl. 244-25.000.
Slater, Thomas S.; and Jadatz, Harald B., to Slater Electric Inc. Circuit interrupter relay. 4,086,549, Cl. 335-18.000.
Slattery, Sidney Edward, to Rolls-Royce Limited. Combustion chambers for gas turbine engines. 4,085,580, Cl. 60-39.650.
Sloan, Tod Hunter: *See—*
Conca, Romeo John; Gray, John Patrick; and Sloan, Tod Hunter, 4,086,129, Cl. 162-49.000.
Small, Sam W.: *See—*
Serpas, Luis B.; Small, Sam W.; and Ellers, Frederick S., 4,085,781, Cl. 141-1.000.
Smith, Clive Richard; and Mills, Brian. Treatment of effluent. 4,085,688, Cl. 110-238.000.
Smith, Craig A.; and George, Clifford L., to Xerox Corporation. Dual purpose document and copy sheet feed cassette. 4,086,007, Cl. 355-3.00R.
Smith, Fred T., to Sargent Industries, Inc. Front end loader with improved apparatus for operating the lifting arms. 4,085,857, Cl. 214-302.000.
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Smith, Herman W., to Upjohn Company, The. 13,14-Didehydro-PGA$_1$ compounds. 4,086,258, Cl. 260-408.000.
Smith, Leonard L., Jr.: *See—*
Barrons, Keith C.; Smith, Leonard L., Jr.; and Holmsen, Theodore W., 4,086,081, Cl. 71-126.000.
Smith, Leonard S., to Century Mfg. Co. Shunt positioning device. 4,086,551, Cl. 336-45.000.
Smith, Leslie Harold: *See—*
Large, Michael Stewart; and Smith, Leslie Harold, 4,086,357, Cl. 424-275.000.
Smith, Maurice I.; and DePinto, Victor M., to Tone Commander Systems, Inc. Dial pulse key telephone intercom system. 4,086,444, Cl. 179-99.000.
Smith, Oliver Wendell; and Koleske, Joseph Victor, to Union Carbide Corporation. Low energy-curable high solids coating compositions. 4,086,293, Cl. 260-830.00R.
Smith, Oliver Wendell: *See—*
Koleske, Joseph Victor; and Smith, Oliver Wendell, 4,086,294, Cl. 260-834.000.
Smith, Trevor James, to Imperial Chemical Industries Limited. Process for the manufacture of anthraquinone compounds. 4,086,252, Cl. 260-376.000.
SmithKline Corporation: *See—*
Zirkle, Charles Leon, 4,086,350, Cl. 424-267.000.
Snetsinger, David C.; and Zimmerman, Ray A., to Ralston Purina Company. Method of feeding laying hens. 4,086,365, Cl. 426-2.000.
Societe Anonyme D.B.A.: *See—*
Kervagoret, Gilbert, 4,085,657, Cl. 91-380.000.
Kervagoret, Gilbert, 4,085,817, Cl. 180-132.000.
Thioux, Alain, 4,085,828, Cl. 188-71.600.
Societe Anonyme de Traitement des Metaux et Alliages (SATMA): *See—*
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Societe Chimique des Charbonnages: *See—*
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Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Caruel, Jacques Emile Jules; and Stora, Guy Daniel, 4,085,581, Cl. 60-39.660.
Societe Nationale Industrielle Aerospatiale: *See—*
Jalaguier, Jean-Pierre, 4,086,014, Cl. 403-317.000.
Societe Nouvelle du Plastique: *See—*
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Societe Suisse pour l'Industrie Horlogere Management Services, S.A.: *See—*
Deverin, Jacques Alain, 4,085,576, Cl. 58-23.00R.
Soeda, Katsuji; Sakuma, Fumio; and Oyama, Mitsuhiro, to Yamamoto Electric Industrial Co., Ltd. Motor control apparatus for electrically-driven sewing machine. 4,085,692, Cl. 112-275.000.
Solder Removal Co.: *See—*
Sylvester, Joseph A., 4,086,465, Cl. 219-236.000.
Solomon, Irvine J.; and Silberman, Louis B., to United States of America, Army. Process for preparing cyclotetramethylenetetranitramine. 4,086,228, Cl. 260-239.0HM.
Sombuthawee, Charussri: *See—*
Hummel, Floyd A.; and Sombuthawee, Charussri, 4,086,123, Cl. 106-293.000.
Sommer, Edward G., Jr., to General Electric Company. Clothes dryer gas heater assembly. 4,086,053, Cl. 432-222.000.
Song, Il H., to Richardson Company, The. Thermoplastic molding composition comprising a terpolymer of α-methylstyrene, methyl methacrylate and N-vinyl-2-pyrrolidone. 4,086,410, Cl. 526-264.000.

Song, Jong Shik: *See*—
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Song, Jung Shik: *See*—
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Sonneville, Roger Paul. Device for anchoring fixing means in a concrete element. 4,085,556, Cl. 52-223.00R.
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Hoshimi, Susumu, 4,085,940, Cl. 274-15.00R.
Sorensen, Keld Torben Schneider, to K. & V. Sorensen Engineering Limited. Operating means. 4,085,658, Cl. 91-461.000.
South Eastern Cordage Company: *See*—
Moss, Theron V., 4,085,476, Cl. 15-229.00A.
South Warwickshire Packaging Services Limited: *See*—
Williams, John, 4,085,846, Cl. 206-600.000.
Sparlin, Derry D.: *See*—
Sifferman, Thomas R.; and Sparlin, Derry D., 4,085,801, Cl. 166-295.000.
Sifferman, Thomas R.; and Sparlin, Derry D., 4,085,802, Cl. 166-295.000.
Speiser, Maxmilian Richard; Eng, Don; and Sawyer, Gerry Dun. Computer type golf game having visible fairway display. 4,086,630, Cl. 364-410.000.
Spencer, Bruce J., to Dentsply Research & Development Corporation. Operatory stool with clutch for rest member. 4,085,967, Cl. 297-115.000.
Sperry Rand Corporation: *See*—
Mortier, Frans H.; and Degraeve, Frans, 4,085,571, Cl. 56-208.000.
Speyer, Jason L.: *See*—
Gustafson, Donald E.; and Speyer, Jason L., 4,086,539, Cl. 328-155.000.
Spirig, Ernst. Closed space integrity. 4,086,586, Cl. 340-258.00B.
Sponer, Gisbert: *See*—
Friebe, Walter-Gunar; Thiel, Max; Stach, Kurt, deceased; Plattner, Werner, administrator; Wilhelms, Otto-Henning; von Mullendorff, Erika; and Sponer, Gisbert, 4,086,347, Cl. 424-253.000.
Spoor, Herbert: *See*—
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Sprague, Peter W., to E. R. Squibb & Sons, Inc. Amidines. 4,086,244, Cl. 260-340.300.
Springthorpe, Anthony John; and Rider, Michael John, to Northern Telecom Limited. Production of high radiance light emitting diodes. 4,086,126, Cl. 156-642.000.
Square D Company: *See*—
Fischer, Don G.; and Holland, Harold, 4,085,599, Cl. 70-14.000.
Srinivas, Srivas Rangachar. System for preparing packed columns and coated capillary tubes useful in gas chromatography. 4,086,051, Cl. 432-198.000.
Stabilator AB: *See*—
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Stach, Kurt, deceased: *See*—
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Stadler, Eberhard: *See*—
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Stal-Laval Turbin AB: *See*—
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Stamires, Dennis: *See*—
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Stamper, Robert. Nailing tool. 4,085,882, Cl. 227-110.000.
Standard Oil Company (Indiana): *See*—
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Stanford Research Institute: *See*—
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Crane, Hewitt David; and Wolf, Daniel Errol, 4,086,567, Cl. 340-146.3SY.
Stange, Ronald R., to Tools for Bending, Inc. Bending and straightening mechanism for mine roof bolts. 4,085,492, Cl. 29-431.000.
Stangl, Ernst: *See*—
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Staudt, Heinrich: *See*—
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Fancher, Llewellyn W., 4,086,239, Cl. 260-306.80R.
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Stavropoulos, William S.: *See*—
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Stedefeder, Joachim; Dorn, Ingo H.; Kuhn, Horst; Kastenhuber, Walter; and Linke, Wolfgang, to BASF Aktiengesellschaft. Purification of copolymers containing crotonic acid. 4,086,413, Cl. 528-499.000.
Steel Company of Canada, Limited, The: *See*—
Kelly, John H., 4,085,609, Cl. 73-101.000.
Steele, Everett T., Jr., to Robertshaw Controls Company. Three port valve construction and method of making the same. 4,085,775, Cl. 137-625.500.
Steensma, Peter Dennis, to International Telephone and Telegraph Corporation. Optical amplitude modulation modulator. 4,086,484, Cl. 250-199.000.
Stefanoff, Boris T. Parallel wall indicator. 4,085,514, Cl. 33-343.000.
Steffen, David Eugene, to Dickey-john Corporation. Automatically controlled seed planter. 4,085,862, Cl. 221-8.000.
Stegen, Gary E.: *See*—
Moore, Raymond H.; and Stegen, Gary E., 4,086,323, Cl. 423-210.500.
Steig, Hans: *See*—
Sundberg, Erik G.; and Steig, Hans, 4,086,401, Cl. 429-145.000.
Steiger Tractor Inc.: *See*—
Joubert, Jerauld D., 4,085,813, Cl. 180-14.00A.
Steimel, Richard. Centrifuge having separable centrifuge vessel. 4,085,889, Cl. 233-20.00R.
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Steiner, Eginhard; and Beffa, Fabio, to Ciba-Geigy AG. Asymmetrical 1:2-chromium complex azo dyestuffs. 4,086,223, Cl. 260-151.000.
Steiner Industries, Inc.: *See*—
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Steiner, Robert J.; and Kuzelka, John, to Steiner Industries, Inc. Modular welding screen apparatus. 4,085,789, Cl. 160-135.000.
Stelzer, Ernest L.: *See*—
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Sten, Matti: *See*—
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Stenfors, Svante Bengt Gosta, to Stal-Laval Turbin AB. Cooled guide vane. 4,086,021, Cl. 415-115.000.
Stephan, Alfred, to White-Westinghouse Corporation. Oil pump for motor compressor. 4,086,033, Cl. 417-368.000.
Sterling Drug Inc.: *See*—
Lesher, George Y.; and Singh, Baldev, 4,086,233, Cl. 260-256.40C.
Stevens, Violete L.; Sexton, Arthur R.; and Corson, Frederick P., to Dow Chemical Company, The. Curable mixtures and cured resins made from linear polymers of glycidol. 4,086,151, Cl. 204-159.160.
Stewart, John M., to Sanitation Equipment Limited. Diaphragm pump. 4,086,037, Cl. 417-571.000.
Stewart-Warner Corporation: *See*—
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Still GmbH (vormals SE-Fahrzeugwerke GmbH): *See*—
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Stinson, Kenneth R.: *See*—
Chelikowsky, Richard D.; and Stinson, Kenneth R., 4,086,593, Cl. 343-106.00R.
Stoeckl, Wilhelm: *See*—
Krumrey, Guenter; and Stoeckl, Wilhelm, 4,086,493, Cl. 250-468.000.
Stone, Thomas G., to Evans Products Company. End fitting. 4,085,685, Cl. 105-498.000.
Stora, Guy Daniel: *See*—
Caruel, Jacques Emile Jules; and Stora, Guy Daniel, 4,085,581, Cl. 60-39.660.
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Strickland, John C.: *See*—
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Strike, Donald P.; and Kao, Wenling, to American Home Products Corporation. 11-Deoxy-15-substituted prostaglandins. 4,086,269, Cl. 260-514.00D.
Stroszynski, Joachim, to Hoechst Aktiengesellschaft. Method and apparatus for freely suspending moving webs of material. 4,085,522, Cl. 34-156.000.
Stunkel, Barry A. Control device for power tools. 4,085,659, Cl. 92-8.000.
Sturgeon, Wayne: *See*—
Freund, Robert F.; and Sturgeon, Wayne, 4,086,483, Cl. 362-311.000.
Suami, Tetsuo; Machinami, Tomoya; and Hisamatsu, Takashi, to Suami, Tetsuo. Nitrosourea derivatives of glycosides. 4,086,415, Cl. 536-22.000.
Suen, Tzeng Jiueq; Begala, Arthur James, Jr.; and Grayson, Martin, to American Cyanamid Company. Control of corrosion and scale in circulating water systems by means of partial esters of polyfunctional organic acids. 4,086,181, Cl. 252-180.000.
Sugimoto, Shigeo: *See*—
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Sugio, Akitoshi; Masuda, Yukiya; Kobayashi, Toshihiko; Nakano, Koichi; and Sawai, Tsukasa, to Mitsubishi Gas Chemical Company, Inc. Process for roughening surface of epoxy resin. 4,086,128, Cl. 156-668.000.

Sugita, Terumitsu, to Seiko-Seiki Kabushiki Kaisha. Method to dress a grinding wheel. 4,085,554, Cl. 51-325.000.
Sugiyama, Fumio: *See—*
Asakawa, Shigeru; Sugiyama, Fumio; Gotoh, Akio; and Okamoto, Shigenori, 4,086,537, Cl. 325-478.000.
Sullivan, Philip J., to American Optical Corporation. Lens-casting cell. 4,085,919, Cl. 249-134.000.
Sumitomo Electric Industries, Ltd.: *See—*
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Sumitomo Kinzoku Kogyo Kabushiki Kaisha: *See—*
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Sumitomo, Yuji: *See—*
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Sun Studs, Inc.: *See—*
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Sunbeam Corporation: *See—*
Beck, William P.; Carr, Francis L.; and Gronwick, Jerry P., 4,085,503, Cl. 30-34.100.
Sundberg, Erik G.; and Steig, Hans, to Aktiebolaget Tudor. Electric storage battery separator. 4,086,401, Cl. 429-145.000.
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Schneider, Abraham; Ware, Richard E.; and Janoski, Edward J., 4,086,284, Cl. 260-666.0PY.
Wynkoop, Raymond; and Hancock, Allen W., II, 4,086,270, Cl. 260-515.00P.
Sussman, Arthur. Folding system with photoelectric detection means. 4,085,928, Cl. 270-61.00R.
Sutter, Robert F.: *See—*
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Suzuki, Masaaki; Shirahata, Ryuji; Aonuma, Masashi; and Kitamoto, Tatsuji, to Fuji Photo Film Co., Ltd. Production of magnetic recording material. 4,086,374, Cl. 427-48.000.
Suzuki, Osamu; Oishi, Kengo; Akashi, Goro; and Sega, Kenji, to Fuji Photo Film Co., Ltd. Magnetic tape magazine. 4,085,907, Cl. 242-199.000.
Suzuki, Takeshi: *See—*
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Suzuki, Toshiyuki: *See—*
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Suzuki, Yasoji; and Kiyofumi, Ochii, to Tokyo Shibaura Electric Co., Ltd. Address decoder. 4,086,500, Cl. 307-270.000.
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Svensson, Assar Natanael, to Skega AB. Method of producing a paving mass and a paving mass produced by the method. 4,086,291, Cl. 260-758.000.
Svensson, Sven Arne; and Ebbeson, Bengt Ebbe Oscar, to Origoverken I Halmstad AB. Bicycle chair for children. 4,085,968, Cl. 297-243.000.
Swager, William E. Plastic ladder and safety device. 4,085,818, Cl. 182-47.000.
Swanson, Bernard August. Ignitor for starting fires. 4,086,049, Cl. 431-271.000.
Sweet, Robert D., Jr.; and Monaghan, Peter J. Method of making a hockey stick. 4,086,115, Cl. 156-178.000.
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Sybertz, Hans; and Riedl, Reinhold, to Hombak Maschinenfabrik KG. Method of and apparatus for positioning blades of a wood-chipping cutter drum. 4,085,494, Cl. 29-468.000.
Sycor, Inc.: *See—*
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Synchro-Start Products, Inc.: *See—*
Lace, Melvin A., 4,086,647, Cl. 361-239.000.
Syntex (U.S.A.) Inc.: *See—*
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Szeluga, Ludwick; and Voegelin, Howard J., to Veeder Industries Inc. Document actuated interlock mechanism. 4,085,931, Cl. 271-265.000.
Szoeke, Joseph. Wind powered rotary electric generator. 4,086,498, Cl. 290-55.000.
Taguchi, Tetsuya: *See—*
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Takahashi, Fumitaka, to Honda Giken Kogyo Kabushiki Kaisha. Snap action type of electric switch. 4,086,455, Cl. 200-76.000.
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Takahashi, Nagashige. Light source and exposure control device for endoscopic photography. 4,086,583, Cl. 354-62.000.
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Takahashi, Yukiharu, to Tokyo Shibaura Electric Co., Ltd. Pulse train converter. 4,086,471, Cl. 235-92.0DM.
Takaishi, Naotake: *See—*
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Takano, Kazuro, to Matsushita Electric Industrial Co., Ltd. Loudspeaker with burning resistant diaphragm. 4,086,449, Cl. 179-181.00R.
Takano, Rikuo; Ohta, Yutaka; Sumitomo, Yuji; Shimazawa, Yoichi; and Aiba, Masahiko, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Vertical tabulation control for high speed printer. 4,085,837, Cl. 197-133.00R.
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Kouchi, Akihiko; Otake, Tsutomu; Takeshita, Hiroshi; and Inoue, Kunihiro, 4,086,003, Cl. 350-357.000.
Taketani, Yutaka: *See—*
Hara, Shigeyoshi; Senoo, Masao; Mori, Koh; and Taketani, Yutaka, 4,086,209, Cl. 260-49.000.
Takeuchi, Torataro: *See—*
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Takigawa, Tomoshi: *See—*
Ishikawa, Kazuo; Sakaguchi, Keiichi; Takigawa, Tomoshi; Hirata, Noritsugu; Tajima, Akira; and Tsuji, Sadahiko, 4,086,605, Cl. 354-270.000.
Tamanini, Robert J. Windmill with radial vanes. 4,086,026, Cl. 416-176.000.
Tanabe, Seiichi; and Ito, Syoji, to Hitachi, Ltd. Hydraulic machine. 4,086,020, Cl. 415-106.000.
Tanahashi, Junichi: *See—*
Matsuyama, Shunsuke; Tanahashi, Junichi; Imamura, Kenso; and Majima, Teiji, 4,086,661, Cl. 365-39.000.
Tanaka, Akio, to Tokyo Shibaura Electric Co., Ltd. Pressure-electric transducers. 4,085,620, Cl. 73-727.000.
Tanaka, Eizi; Ohashi, Michihiro; and Mochizuki, Hiroshi, to Nippon Soken, Inc. Fuel control system for internal combustion engine. 4,085,723, Cl. 123-139.0AW.
Tanaka, Hiroki: *See—*
Yoshinouchi, Sumio; and Tanaka, Hiroki, 4,085,660, Cl. 92-119.000.
Tanaka, Koji: *See—*
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Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. Digital electronic timepiece. 4,085,575, Cl. 58-4.00A.
Tanaka, Makoto: *See—*
Kohashi, Takahiro; Akagi, Motoo; Oba, Yoichi; Nonogaki, Saburo; Tanaka, Makoto; Kaneko, Tadao; and Tomita, Yoshifumi, 4,086,090, Cl. 96-35.100.
Tanaka, Taro: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,085,713, Cl. 123-75.00B.
Tanaka, Tatsundo: *See—*
Kurihara, Masaru; Tokizane, Soichi; Tanaka, Tatsundo; Tanimura, Masamitsu; and Shimokawa, Yoichi, 4,086,215, Cl. 260-78.00R.
Tanaka, Yoshikazu: *See—*
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Tanaka, Yukiyasu: *See—*
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Yukiyasu; and Tanaka, Taro, 4,085,713, Cl. 123-75.00B.
Tangri, Kuldip Chand. Hydrogen fuel system for a vehicle. 4,085,709, Cl. 123-1.00A.
Tanigaki, Takashi; Koshio, Takeshi; and Tanaka, Yoshikazu, to Nippon Steel Corporation. Coating composition comprising crystalline cellulose and a coated electrode for arc welding produced therewith. 4,086,389, Cl. 428-385.000.
Tanimoto, Akira; and Nishimura, Kosuke, to Sharp Kabushiki Kaisha. Combination timepiece and calculator including slidable keyboard means. 4,086,655, Cl. 364-705.000.
Tanimura, Masamitsu: *See—*
Kurihara, Masaru; Tokizane, Soichi; Tanaka, Tatsundo; Tanimura, Masamitsu; and Shimokawa, Yoichi, 4,086,215, Cl. 260-78.00R.
Tanino, Mitsuru; Komatsu, Hajime; and Takemura, Susumu, to Nippon Steel Corporation. Heat treatment process of high-carbon chromium-nickel heat-resistant stainless steels. 4,086,107, Cl. 148-136.000.
Tapola, Esko; Sten, Matti; and Koistinen, Onni, to Enso-Gutzeit Osakeyhtio. Biofilter. 4,086,167, Cl. 210-150.000.
Tapphorn, Ralph M.: *See—*
Schweitzer, Jeffrey S.; and Tapphorn, Ralph M., 4,085,798, Cl. 166-252.000.
Taschner, Walter: *See—*
Mayrhofer, Max; and Taschner, Walter, 4,086,105, Cl. 148-12.00R.
Tassie, Douglas Pray; and Pustell, Robert A., to General Electric Company. Ignition device. 4,085,653, Cl. 89-7.000.
Tasson, Michel: *See—*
Peuzin, Jean Claude; and Tasson, Michel, 4,086,124, Cl. 156-603.000.
Tatyrek, Alfred F. Heat stable colored chemiluminescent compositions. 4,086,183, Cl. 427-157.000.
Taub Family Trust U/A Sept. 1, 1967: *See—*
Taub, Ronald H., 4,085,986, Cl. 312-236.000.
Taub, Ronald H., to Taub Family Trust U/A Sept. 1, 1967. Auxiliary refrigerated display case. 4,085,985, Cl. 312-236.000.
Taylor, Eric: *See—*
Bailes, Thomas Alan; and Taylor, Eric, 4,085,478, Cl. 15-245.000.
Taylor, Lynn J.: *See—*
Tobias, John W.; and Taylor, Lynn J., 4,086,373, Cl. 427-44.000.
Taylor, Robert Marvin, to Bell Telephone Laboratories, Incorporated. Emergency announcement system. 4,086,446, Cl. 179-27.00G.
Technion Research and Development Foundation Ltd.: *See—*
Neumann, Peter, 4,086,331, Cl. 424-45.000.
TED Bildplatten Aktiengesellschaft AEG-Telefunken-Teldec: *See—*
Joschko, Gunter; and Schriefl, Karl-Ekkehard, 4,085,939, Cl. 274-1.00R.
Teijin Limited: *See—*
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Tejima, Iwao: *See—*
Nakagawa, Taizo; Ohmori, Kaoru; Watanabe, Yutaka; Tejima, Iwao; Ishida, Shuichi; Suzuki, Toshiyuki; and Yamada, Osamu, 4,086,360, Cl. 424-300.000.
Teldix GmbH: *See—*
Leiber, Heinz; Gerstenmeier, Jurgen; and Klotz, Hermann, 4,085,979, Cl. 303-92.000.
Teletech Corporation: *See—*
Kahn, Daniel W.; and Skidmore, Thomas A., 4,086,438, Cl. 179-18.0BE.
Temco Products, Inc.: *See—*
Thomas, Morton I., 4,085,763, Cl. 135-69.000.
Terada, Takami: *See—*
Nakane, Mototaka; and Terada, Takami, 4,085,969, Cl. 297-367.000.
Terada, Ziro: *See—*
Nitta, Tsuneharu; Terada, Ziro; and Hayakawa, Shigeru, 4,086,556, Cl. 338-35.000.
Ternes, William A. Roof-top observation center for automobiles. 4,085,666, Cl. 98-2.140.
Terry, Raymond O., Jr.: *See—*
Robbins, Theodore W.; and Terry, Raymond O., Jr., 4,086,548, Cl. 333-81.00R.
Tesch, Hugo W., to Elpower Corporation. Combination of a battery and vent structure. 4,086,394, Cl. 427-54.000.
Teschner, Wolfgang; and von Massow, Hans-Jurgen, to Carl Still Recklinghausen, Firma. Method and apparatus for determining the covering of a coke wharf with quenched coke. 4,085,852, Cl. 214-17.00R.
Teshirogi, Toshihiko, to Cybernet Electronic Corporation. Phase locked loop type transmitter receiver. 4,086,545, Cl. 331-16.000.
Tessler, Martin M., to National Starch and Chemical Corporation. Preparation of starch sulfate esters. 4,086,419, Cl. 536-107.000.
Texaco Inc.: *See—*
Bousaid, Issam S.; Brown, Alfred; and Norman, Thomas W., 4,085,799, Cl. 166-272.000.
MacLean, John P.; and Strickland, John C., 4,086,064, Cl. 23-288.00G.
Rundell, Herbert A., 4,085,612, Cl. 73-136.00A.
Texas Instruments Incorporated: *See—*
Boulanger, Henry J., 4,086,451, Cl. 200-5.00A.
Bullock, David Carl, 4,086,571, Cl. 365-36.000.
Bullock, David Carl, 4,086,572, Cl. 365-12.000.
Ezell, George D.; Murphy, Marvin L., Jr.; and Davis, Paul D., Jr., 4,086,504, Cl. 340-15.5TS.
Grant, John L., 4,086,467, Cl. 219-544.000.
Nelson, Kris L., 4,085,765, Cl. 137-68.00R.
Pejouhy, Radi; and McMorrow, Joseph L., 4,086,558, Cl. 337-102.000.
Textron Inc.: *See—*
Thompson, Leo M.; Anderson, Robert K.; Kocher, Lawrence H.; and Jackel, John W., 4,085,865, Cl. 222-1.000.
Th. Kieserling & Albrecht: *See—*
Goeke, Alfons, 4,086,016, Cl. 407-114.000.
Tharp, James A., to Tharp, James A. Raised access floor system. 4,085,557, Cl. 52-263.000.
Thermo Electron Corporation: *See—*
Gernes, David B., 4,086,653, Cl. 364-564.000.
Thiel, Alfons W.; Martini, Hans; Wolf, Peter; and Runkel, Albert, to Bellaplast GmbH. Article treatment apparatus. 4,085,517, Cl. 34-21.000.
Thiel, Alfons W.; and Hell, Hans, to Bellaplast GmbH. Apparatus for the manufacture of thin-walled shaped articles of thermoplastic material. 4,086,045, Cl. 425-326.100.
Thiel, Max: *See—*
Friebe, Walter-Gunar; Thiel, Max; Stach, Kurt, deceased; Plattner, Werner, administrator; Wilhelms, Otto-Henning; von Mullendorff, Erika; and Sponer, Gisbert, 4,086,347, Cl. 424-253.000.
Thiokol Corporation: *See—*
Levinthal, Michael L., 4,086,110, Cl. 149-19.400.
Thioux, Alain, to Societe Anonyme D.B.A. Disc brake and heat shield for the same. 4,085,828, Cl. 188-71.600.
Thomas, Morton I., to Temco Products, Inc. Quad cane. 4,085,763, Cl. 135-69.000.
Thompson, Leo M.; Anderson, Robert K.; Kocher, Lawrence H.; and Jackel, John W., to Textron Inc. Elastomeric bladder for positive expulsion tank. 4,085,865, Cl. 222-1.000.
Thompson, Omer A. Slat assembly for chain link fence. 4,085,954, Cl. 256-34.000.
Thomson-CSF: *See—*
Guyot, Lucien, 4,086,515, Cl. 315-10.000.
Three Phoenix Company: *See—*
Dahl, John Conlan; and Barnett, David Lee, 4,085,906, Cl. 242-192.000.
Thune-Eureka A/S: *See—*
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Timken Company, The: *See—*
Cameron, Robert W., 4,085,984, Cl. 308-207.00A.
Timothy, John G.: *See—*
Bybee, Richard Lee; and Timothy, John G., 4,086,486, Cl. 250-207.000.
Tinney, Lyle D. Water heater overflow pan. 4,085,773, Cl. 137-571.000.
Tobias, John W.; and Taylor, Lynn J., to Owens-Illinois, Inc. Protective polymeric coating for glass substrate. 4,086,373, Cl. 427-44.000.
Todd, Harry V. Fishing lure retriever. 4,085,537, Cl. 43-17.200.
Todt, William H., Sr., to Westinghouse Electric Corporation. Wide range neutron detection system. 4,086,490, Cl. 250-385.000.
Toepke, Ival Lee, to Addressograph Multigraph Corporation. Imaging methods for use with charged particle modulator device. 4,086,088, Cl. 96-1.00R.
Tokico Ltd.: *See—*
Ando, Hiromi, 4,085,656, Cl. 91-376.00R.
Tokizane, Soichi: *See—*
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Tokyo Shibaura Electric Co., Ltd.: *See—*
Asakawa, Shigeru; Sugiyama, Fumio; Gotoh, Akio; and Okamoto, Shigenori, 4,086,537, Cl. 325-478.000.
Kumagai, Shigeki, 4,086,473, Cl. 235-92.0EA.
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Okano, Michiaki, 4,086,478, Cl. 235-466.000.
Suzuki, Yasoji; and Kiyofumi, Ochii, 4,086,500, Cl. 307-270.000.
Takahashi, Yukiharu, 4,086,471, Cl. 235-92.0DM.
Tanaka, Akio, 4,085,620, Cl. 73-727.000.
Tomchak, Sigfrid A. Solar energy heater. 4,085,728, Cl. 126-270.000.
Tomczuk, Zygmunt: *See—*
Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, 4,086,404, Cl. 429-220.000.
Tomita, Yoshifumi: *See—*
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Tompkins, Terence Neville: *See—*
Nijman, John Peter; and Tompkins, Terence Neville, 4,085,497, Cl. 29-566.300.
Tomy Kogyo Co., Inc.: *See—*
Hamano, Nubuo, 4,085,932, Cl. 272-8.00P.
Mitamura, Isao, 4,085,542, Cl. 46-256.000.
Tone Commander Systems, Inc.: *See—*
Smith, Maurice I.; and DePinto, Victor M., 4,086,444, Cl. 179-99.000.
Ullakko, Richard J.; and Edwards, Gerald L., 4,086,441, Cl. 179-84.00C.
Toney, David: *See—*
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Stange, Ronald R., 4,085,492, Cl. 29-431.000.
Toray Industries, Inc.: *See—*
Ezumi, Yuh; Kobayashi, Masaharu; Kubota, Takashi; and Shimokawa, Yoichi, 4,086,093, Cl. 96-86.00P.

Kurihara, Masaru; Tokizane, Soichi; Tanaka, Tatsundo; Tanimura, Masamitsu; and Shimokawa, Yoichi, 4,086,215, Cl. 260-78.00R.
Torgerson, Duane E., to Belden Corporation. Nonconductive light guard. 4,086,482, Cl. 362-376.000.
Toriumi, Shiro; and Endo, Hiroshi, to Minolta Camera K.K. Microfiche reader control means. 4,086,469, Cl. 235-92.0MP.
Toro Company, The: *See—*
Hunter, Edwin J., 4,085,771, Cl. 137-344.000.
Toshimitsu, Naohiko, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Magnetic head which minimizes the effect of minute variations in the head gap. 4,086,639, Cl. 360-126.000.
Toso, Katsuya: *See—*
Kubo, Sueki; Toso, Katsuya; and Fujita, Masayuki, 4,085,894, Cl. 239-121.000.
Toth, Geza; Toth, Istvan; and Montay, Tibor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara. Process for the preparation of carbamate derivatives. 4,086,246, Cl. 260-340.90R.
Toth, Istvan: *See—*
Toth, Geza; Toth, Istvan; and Montay, Tibor, 4,086,246, Cl. 260-340.90R.
Toth, Leslie J., to Botelco. Sensing circuit. 4,086,502, Cl. 307-308.000.
Tournayre, Jean Claude; and Vogel, Christian, to Ciba-Geigy Corporation. Halogeno-acetanilides as herbicides. 4,086,080, Cl. 71-118.000.
Tovey, Charles A.: *See—*
Hutto, Ernest L.; and Tovey, Charles A., 4,085,964, Cl. 296-91.000.
Toyo Boseki Kabushiki Kaisha: *See—*
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Toyo Jozo Kabushiki Kaisha: *See—*
Sakakibara, Shumpei; Morikawa, Tadanori; Munekata, Eisuke; Kimura, Terutoshi; Nakagawa, Yasuo; and Noda, Toshiharu, 4,086,221, Cl. 260-112.50T.
Toyo Kohan Co., Ltd.: *See—*
Ariga, Keiji; Tsutsui, Nobuyuki; and Kanda, Katsumi, 4,086,153, Cl. 204-181.00R.
Toyo Soda Manufacturing Co., Ltd.: *See—*
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Toyoshima, Iwao; Ishii, Kunio; Sawada, Hideo; Kawamoto, Junji; and Yokota, Hiromu, to Daicel Ltd. Tobacco filter. 4,085,760, Cl. 131-268.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nogami, Tomoyuki, 4,085,978, Cl. 303-6.00C.
Nomura, Yoshihisa, 4,085,824, Cl. 188-1.00A.
Shibata, Norio, 4,085,586, Cl. 60-277.000.
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Cassandrini, Paolo; and Tozzi, Antonio, 4,086,204, Cl. 260-45.8NT.
Cassandrini, Paolo; and Tozzi, Antonio, 4,086,207, Cl. 260-45.80N.
Trantham, Joseph C.; and Meldau, Robert F., to Phillips Petroleum Company. Progressive displacement of residual water past shut-in wells preparatory to tertiary oil recovery. 4,085,797, Cl. 166-245.000.
Trappeur, S. A.: *See—*
Delery, Marc, 4,085,528, Cl. 36-121.000.
Traut, Earl W. Toothed rolling contact devices. 4,085,980, Cl. 308-205.000.
Travis, Sigmund D., to C. R. Reichel Engineering Co. Inc. Self ejecting drill chuck key. 4,085,943, Cl. 279-1.00K.
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Tregear, Geoffrey William, to Armour Pharmaceutical Company. Parathyroid hormone. 4,086,196, Cl. 260-112.50R.
Trepka, William J., to Phillips Petroleum Company. Coupling lithium-initiated polymer with a vinylhalomethylarene. 4,086,406, Cl. 526-25.000.
Trescher, Viktor: *See—*
Bocker, Ernst; Kracht, Wolfgang; Rupp, Roland; Schellmann, Erhard; Trescher, Viktor; and Ullrich, Martin, 4,086,346, Cl. 424-253.000.
Tresser, Dietfried, to Laeis-Werke AG. Process for fabricating hollow races or wheels provided at their lateral ends with axle stumps in which process substantially no chips are produced; and races and wheels manufactured in accordance with this process. 4,085,489, Cl. 29-110.000.
Treuner, Uwe: *See—*
Breuer, Hermann; and Treuner, Uwe, 4,086,422, Cl. 544-21.000.
Triolo, Rocco P. Hot compressed fabric conditioning product. 4,086,387, Cl. 428-311.000.
Tsuchihashi, Genichi; and Ogura, Katsuyuki, to Sagami Chemical Research Center. Thioprene or furan derivatives and process for preparation thereof. 4,086,420, Cl. 542-413.000.
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Tsuge, Kenji. Holder device for suspending articles such as paper and the like. 4,085,848, Cl. 211-45.000.
Tsuji, Sadahiko: *See—*
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Tsukagoshi, Shigeru: *See—*
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Tsukishima Kikai Co., Ltd.: *See—*
Omori, Jimpei; Kono, Mitsuo; Takeuchi, Toratarо; and Oikawa, Noboru, 4,086,463, Cl. 219-145.220.
Tsunekawa, Tokuichi: *See—*
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Tsuto, Keiichi; Majima, Kanji; and Imamura, Shigeyasu, to Kao Soap Co., Ltd. Process for sulfonation. 4,086,256, Cl. 260-400.000.
Tsutsui, Nobuyuki: *See—*
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Tuchiya, Keiji; Kubota, Junjiro; Takahashi, Katuo; and Suzuki, Etsuo, to Nippon Electric Co., Ltd. Paper feeder including auxiliary belts for improving paper feeding. 4,085,929, Cl. 271-122.000.
Tucker, Kenneth Wayne: *See—*
Juel, Leslie Harrisville; Joo', Louis Arpad; and Tucker, Kenneth Wayne, 4,086,380, Cl. 428-65.000.
Turak, John Lewallen: *See—*
Ritsema, Irving Ray; and Turak, John Lewallen, 4,085,826, Cl. 188-1.00A.
Turbak, Albin Frank; Hammer, Richard Benjamin; Portnoy, Norman A.; and West, Arthur C., to International Telephone and Telegraph Corporation. Process for producing a regenerated hollow cellulosic fiber. 4,086,418, Cl. 536-30.000.
Turner, Elton W.: *See—*
Turner, Raymond R.; Turner, Elton W.; Turner, Jerry; and Winkler, Robert J., 4,085,686, Cl. 108-25.000.
Turner, Jerry: *See—*
Turner, Raymond R.; Turner, Elton W.; Turner, Jerry; and Winkler, Robert J., 4,085,686, Cl. 108-25.000.
Turner, Raymond R.; Turner, Elton W.; Turner, Jerry; and Winkler, Robert J. Collapsible fishing stool. 4,085,686, Cl. 108-25.000.
Turner, William Stanley, to York Trailer Company Limited. Vehicle suspension. 4,085,948, Cl. 280-682.000.
Twohig, Paul Thomas: *See—*
Cheshire, David Alan; Debbas, Samir Costandi; Eger, Richard Thomas; Schermacher, Ken Stephen; and Twohig, Paul Thomas, 4,086,381, Cl. 428-113.000.
Uchidoi, Masanori: *See—*
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Ueda, Yasukiyo; Mori, Keiichi; and Mori, Keijiro, to Matsushita Electric Industrial Co., Ltd. Multiple-mode fluid-flow control valve arrangement. 4,085,921, Cl. 251-129.000.
Ueno, Yoshiki: *See—*
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Ullakko, Richard J.; and Edwards, Gerald L., to Tone Commander Systems, Inc. Message-waiting and do-not-disturb communications system. 4,086,441, Cl. 179-84.00C.
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Union Carbide Corporation: *See—*
Hanold, R. C. Frederick, III, 4,086,649, Cl. 361-321.000.
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Karol, Frederick John; and Wu, Chi-Sung, 4,086,409, Cl. 526-130.000.
Koleske, Joseph Victor; and Smith, Oliver Wendell, 4,086,294, Cl. 260-834.000.
Nausedas, Joseph Anthony, 4,085,878, Cl. 225-19.000.
Reichle, Walter Thomas, 4,086,188, Cl. 252-463.000.
Smith, Oliver Wendell; and Koleske, Joseph Victor, 4,086,293, Cl. 260-830.00R.
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Mishra, Anupama, 4,086,499, Cl. 307-88.0ET.
United Kingdom Atomic Energy Authority: *See—*
Walton, Hyman, 4,086,528, Cl. 324-61.00R.
U.S. Engineering Corporation: *See—*
Conner, Gary L., 4,086,550, Cl. 335-132.000.
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Agriculture: *See—*
Rowland, Stanley P., 4,086,385, Cl. 428-272.000.
Air Force: *See—*
Arnold, Fred E.; and Hedberg, Frederick L., 4,086,248, Cl. 260-345.200.
Gaskill, James R., Jr.; and Weill, Lawrence R., 4,086,657, Cl. 364-757.000.
Goggins, William B., Jr., 4,086,590, Cl. 343-5.0CM.
Hausfeld, Brian A., 4,085,582, Cl. 60-203.000.
Heincker, William R., 4,085,678, Cl. 102-52.000.
Jones, Roy A.; and Mabry, Marshall W., 4,085,584, Cl. 60-250.000.

Kovar, Robert F.; and Arnold, Fred E., 4,086,232, Cl. 260-250.00Q.
Webb, George; and Burgess, Keith D., 4,085,679, Cl. 102-70.00R.

Army: *See—*
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van Haaften, Lourens Theodor. Fluid distribution system. 4,085,769, Cl. 137-119.000.

Vanotti, Guy, to Etablissements Vape. Screw fixing device for structural units of agglomerated material. 4,085,652, Cl. 85-83.000.

Vardi, Joseph; and Kittler, Milton J., to Exxon Research & Engineering Co. Evaporation purge control device. 4,085,721, Cl. 123-136.000.

Varga, John Maximilian Jules, to Carding Specialists Co. Limited. Feeding of fibrous material to carding machines. 4,085,977, Cl. 302-28.000.

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Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, to Cor Tech Research Ltd. Wood lamination method utilizing emulsified phenol-formaldehyde resins. 4,086,125, Cl. 156-62.200.

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Vissers, Donald R.; Nelson, Paul A.; Kaun, Thomas D.; and Tomczuk, Zygmunt, to United States of America, Energy. Electrode including porous particles with embedded active material for use in a secondary electrochemical cell. 4,086,404, Cl. 429-220.000.

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Vowles, Sandra Rae; Jacobs, Michael Alan; and Jackson, Amos Ray. Class of line identifier apparatus and method therefor. 4,086,439, Cl. 179-27.0DA.

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Wachter, Michael P.; and Kanojia, Ramesh Maganlal, to Ortho Pharmaceutical Corporation. Purification of utero-evacuant extracts from plant substances. 4,086,358, Cl. 424-278.000.

Wagner, William A., to Windings, Inc. Straight hole formation with moving guide path. 4,085,902, Cl. 242-43.00R.

Wah Lo, Allen Kwok; and Nims, Jerry Curtis, to Dimensional Development Corporation. System and camera for controlling depth of field in three-dimensional photography. 4,086,585, Cl. 354-115.000.

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Watts, Fred S., Jr.; and Beecher, Lynn Loren, to Public Service Company of Colorado. Modular I/O equipment for controlling field devices directly or as an interface. 4,086,568, Cl. 340-147.00R.

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Weil, Edward D., to Stauffer Chemical Company. Copolycondensation products of β-haloalkyl phosphates and dialkyl phosphonates. 4,086,303, Cl. 260-928.000.

Weiland, Emil; Schwarz, Alois; Mautz, Karl-Heinz; and Frommlet, Hubert, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Apparatus for connecting a rotor blade to a rotor hub. 4,086,024, Cl. 416-140.000.

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Weisshappel, Helmut; Klie, Wolfgang; and Fischer, Wolfgang, to Daimler-Benz Aktiengesellschaft; and Daimler-Benz Aktiengesellschaft. Bumper constructed as an elastomeric hollow spring. 4,085,956, Cl. 293-86.000.

Welle, Hendricus Bernardus Antonius; and Claassen, Volkert, to U.S. Philips Corporation. Aminoethyl oximes having anti-depressive activity. 4,086,361, Cl. 424-304.000.

Wellman, Lester R. Weight bearing treadle. 4,085,810, Cl. 177-209.000.

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Garzia, Aldo; and Williams, Robert D., 4,086,345, Cl. 424-251.000.
Williams, Thomas H.: *See*—
Fillmore, Gary L.; Hill, James D.; Robinson, William F.; and Williams, Thomas H., 4,086,601, Cl. 346-75.000.
Willmann, Karl; and Saufferer, Helmut, to Daimler-Benz Aktiengesellschaft. Atomization device for internal combustion engines. 4,085,717, Cl. 123-119.00E.
Willner, Howard; and Mangiardi, Vito J., to Bio-Rad Laboratories, Inc. Method for the analysis of thyroid hormones. 4,086,059, Cl. 23-230.300.
Wills, Lynn D.: *See*—
Gauss, Robert C.; Sathe, Hemant T.; and Wills, Lynn D., 4,086,596, Cl. 343-715.000.
Windings, Inc.: *See*—
Wagner, William A., 4,085,902, Cl. 242-43.00R.
Wininger, Hershel R.: *See*—
Horine, James H.; Watts, Lowell K.; Wininger, Hershel R.; Kelley, Dale; and Sears, Charles L., 4,085,552, Cl. 51-166.00R.
Winkler, Bruno, to Naturin-Werk Becker & Co. Apparatus for shirring tubular films. 4,085,483, Cl. 17-42.000.
Winkler, Robert J.: *See*—
Turner, Raymond R.; Turner, Elton W.; Turner, Jerry; and Winkler, Robert J., 4,085,686, Cl. 108-25.000.
Winslow, Elden D.: *See*—
Bosley, Roy E.; Mann, Paul T.; Decoteau, Gary D.; Ivie, Kert F.; and Winslow, Elden D., 4,086,368, Cl. 426-464.000.
Winthaegen, Leon M. W.; and Vola, Mathias J. J. M., to Oce-van der Grinten, N.V. Electrophotographic copying apparatus with device for exposing imaged photoconductive plate. 4,086,008, Cl. 355-7.000.
Wirth, Heinrich: *See*—
Hinselmann, Klaus; Penzien, Klaus; Schick, Rupert; Walter, Manfred; Weber, Heinz; and Wirth, Heinrich, 4,086,191, Cl. 260-2.50B.
Wise, Daniel J.: *See*—
Lisiecki, Robert E.; Crawford, Duncan J.; and Wise, Daniel J., 4,085,885, Cl. 229-17.00R.
Wittle, Eugene Leroy; and Rebstock, Mildred Catherine, to Parke, Davis & Company. Nonapeptides and methods for their production. 4,086,219, Cl. 260-112.5LH.
Wittmoser, Adalbert, to Grunzweig & Hartmann und Glasfaser AG. Casting method using cavityless mold. 4,085,790, Cl. 164-7.000.
Witzke, Horst: *See*—
Cartmell, Donald K.; and Witzke, Horst, 4,086,398, Cl. 429-111.000.
Wohleber, David A.: *See*—
Martin, Edward S.; and Wohleber, David A., 4,086,320, Cl. 423-135.000.
Wolf, Daniel Errol: *See*—
Crane, Hewitt David; and Wolf, Daniel Errol, 4,086,567, Cl. 340-146.3SY.
Wolf, Peter: *See*—
Thiel, Alfons W.; Martini, Hans; Wolf, Peter; and Runkel, Albert, 4,085,517, Cl. 34-21.000.
Wolf, Peter S.: *See*—
Cervoni, Peter P.; and Wolf, Peter S., 4,086,363, Cl. 424-330.000.
Wonder Products Company: *See*—
Morris, James B. N., 4,085,951, Cl. 285-334.000.
Wood, Donald L.; Moore, Robert J.; and Rhodes, Robert B., to Shell Oil Company. Lubricating composition having a selectively sulfonated and hydrogenated block copolymer viscosity-index improver. 4,086,171, Cl. 252-33.000.
Wood, Everett J., Jr. Automatic fishing device. 4,085,536, Cl. 43-15.000.
Wooddy, Douglas William, Jr. Marine seismograph cable balancing. 4,086,561, Cl. 340-7.0PC.
Woodrum, Luther Jay, to International Business Machines Corporation. Directory generation system having efficiency increase with sorted input. 4,086,628, Cl. 364-200.000.
Woods, Kevin James. Accelerator for phosphating solutions. 4,086,103, Cl. 148-6.15R.
Worback, David L., to Massey-Ferguson Inc. Mechanism control. 4,085,855, Cl. 214-138.00D.
Woronowicz, Romuald. Seat and trunnion assemblies for rotary valves. 4,085,770, Cl. 137-238.000.
Wrap-ade Machine Company, Inc.: *See*—
McClosky, Robert B., 4,085,560, Cl. 53-27.000.
Wright, Donald R., to Kartridg Pak Company, The. Packaging machine. 4,085,778, Cl. 140-93.00A.
Wu, Chi-Sung: *See*—
Karol, Frederick John; and Wu, Chi-Sung, 4,086,408, Cl. 526-130.000.
Karol, Frederick John; and Wu, Chi-Sung, 4,086,409, Cl. 526-130.000.
Wu, Chin Ching; and Krenzer, John, to Velsicol Chemical Corporation. 1-Thiazolyl-5-phenoxy and phenylthioalkanoyloxyimidazolidinones. 4,086,240, Cl. 260-306.80R.
Wu, Chin Ching; and Krenzer, John, to Velsicol Chemical Corporation. Benzothiazolylimidazolidinone esters of furyl and thienyl substituted acids. 4,086,241, Cl. 260-306.80D.
Wynkoop, Raymond; and Hancock, Allen W., II, to Suntech, Inc. Process for making terephthalic acid. 4,086,270, Cl. 260-515.00P.
Xerox Corporation: *See*—
Cizmic, Stipe; Edwards, Wayne L., Jr.; Jacques, James O.; Mahon, Douglas K.; and Shenfield, Leonard R., 4,086,636, Cl. 360-75.000.
Cizmic, Stipe; Edwards, Wayne L., Jr.; Griffith, David L.; Halfhill, Martin O.; Jacques, James O.; Shenfield, Leonard R.; and Votaw, Ronald W., 4,086,659, Cl. 364-900.000.
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Hauser, Oscar G.; and Ruckdeschel, Frederick R., 4,086,006, Cl. 355-3.0DD.
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Yamada, Takahiro, to Hitachi, Ltd. Printing video signal information using ink drops. 4,086,602, Cl. 346-75.000.
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Yamaki, Hiromi; and Arai, Hiroaki, to Okuma Machinery Works Ltd. System for controlling numerically controlled machine tool used for cutting threads. 4,086,517, Cl. 318-39.000.
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Soeda, Katsuji; Sakuma, Fumio; and Oyama, Mitsuhiro, 4,085,692, Cl. 112-275.000.
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Yamano, Susumu; and Yasuda, Jyunichi, to Oji Yuka Synthetic Paper Sales Co., Ltd. Supports for photographic printing paper. 4,086,383, Cl. 428-174.000.
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Yazaki, Takao; and Hattori, Kazuhide, to Mitsubishi Petrochemical Co., Ltd. Corrugated cardboard sheet and method for producing same. 4,086,116, Cl. 156-205.000.
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Yokogawa Electric Works, Ltd.: *See*—
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Yonezawa, Keitaro, to Aioi Seiki Kabushiki Kaisha. Overload protector for mechanical press. 4,085,669, Cl. 100-53.000.
Yoon, In Bae. Multiple occlusion ring applicator and method. 4,085,743, Cl. 128-6.000.
York Trailer Company Limited: *See*—
Turner, William Stanley, 4,085,948, Cl. 280-682.000.
Yoshida, Hajime: *See*—
Nakayama, Kiyoshi; Araki, Kazumi; and Yoshida, Hajime, 4,086,137, Cl. 195-29.000.
Yoshida, Isao; Hori, Ryoichi; Masuda, Hiroo; Minato, Osamu; Etoh, Jun; and Nakai, Masaaki, to Hitachi, Ltd. Protective circuit and device for metal-oxide-semiconductor field effect transistor and method for fabricating the device. 4,086,642, Cl. 361-91.000.
Yoshida, Mitsuo; Furukawa, Wataru; Yamaguchi, Takashi; and Sasaki, Kazuo, to Sumitomo Kinzoku Kogyo Kabushiki Kaisha; Kabushiki Kaisha Yamamoto Suiatsu Kogyosho; and Nihon Valqua Kogyo Kabushiki Kaisha. Packing for use in steel-pipe hydraulic testing apparatus. 4,085,942, Cl. 277-30.000.
Yoshikawa, Naohiro; Sato, Sadaharu; Matsubara, Masanori; and Hosoda, Masao, to Janome Sewing Machine Co. Ltd. Automatic electrical credit-card imprinter. 4,085,675, Cl. 101-269.000.
Yoshinaga, Kaneyasu. Centrifugal pump. 4,086,306, Cl. 261-93.000.
Yoshinouchi, Sumio; and Tanaka, Hiroki, to Kabushiki Kaisha Komatsu Seisakusho. Pivotal support for a fluid actuated cylinder with means for communicating pressurized fluid thereto. 4,085,660, Cl. 92-119.000.
Young, Buck R., to Hudson Pulp & Paper Corporation. Coating for multi-wall bags. 4,085,851, Cl. 214-10.50R.
Young, Lewis B.: *See*—
Kaeding, Warren W.; and Young, Lewis B., 4,086,287, Cl. 260-671.00R.
Young, Robert R., to Westinghouse Electric Corporation. Rotary compressor and vane assembly therefor. 4,086,042, Cl. 418-139.000.
Yuda, Takuo, to NIFCO Inc. Device for adjusting length of rod. 4,085,623, Cl. 74-89.150.
(Zaidanhojin) Sagami Chemical Research Center: *See*—
Isowa, Yoshikazu; Ohmori, Muneki; Kurita, Hideaki; Ichikawa, Tetsuya; Sato, Masanari; and Mori, Kaoru, 4,086,136, Cl. 195-29.000.
Zaklady Mechaniczne im. Gen. Karola Swierczewskiego "Zamech": *See*—
Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, 4,086,027, Cl. 416-184.000.
Zaluska, Philip J.: *See*—
Bechara, Ibrahim S.; Zaluska, Philip J.; and Mascioli, Rocco L., 4,086,213, Cl. 260-77.5AB.
Zeelen, Filippus Johannes: *See*—
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Zerpner, Dieter; Nedden, Klaus Zur; Frese, Albert; and Datene, Hans, to Chemische Werke Huls Aktiengesellschaft. Heat-sealable vulcanizates comprising polyolefin rubber and propylene polymer. 4,086,301, Cl. 260-897.00A.
Ziccarelli, Salvatore F., to Beatrice Foods Co. Fruit flavored composition. 4,086,367, Cl. 426-98.000.
Ziebold, Steven A.: *See*—
Argo, Wesley B.; Chen, Gilbert K. C.; Kocatas, Babur M.; and Ziebold, Steven A., 4,086,070, Cl. 55-97.000.
Zielenow, Krzysztof: *See*—
Gundlach, Wladyslaw; Porochnicki, Jerzy; Prywer, Jerzy; Karewicz, Boguslaw; Potapczyk, Andrzej; and Zielenow, Krzysztof, 4,086,027, Cl. 416-184.000.
Ziemba, Richard Thomas, to General Electric Company. Fuze encoder. 4,085,680, Cl. 102-70.20R.
Zimmerman, Ray A.: *See*—
Snetsinger, David C.; and Zimmerman, Ray A., 4,086,365, Cl. 426-2.000.
Zirkle, Charles Leon, to SmithKline Corporation. Pharmaceutical compositions and method of producing anti-psychotic activity without extrapyramidal symptoms. 4,086,350, Cl. 424-267.000.
Znamirowski, Henry: *See*—
Kromm, David C.; and Znamirowski, Henry, 4,085,480, Cl. 16-94.00D.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF APRIL, 1978

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Analog Devices, Incorporated: *See—*
Pastoriza, James J., Re. 29,619, Cl. 340-347.0DA.

Bacaner, Marvin B., to University of Minnesota, The Regents of the. Suppression of cardiac ventricular fibrillation and cardiac arrhythmias with bretylium tosylate. Re. 29,618, Cl. 424-316.000.

General Electric Company: *See—*
Takekoshi, Tohru, Re. 29,616, Cl. 260-52.000.
Takekoshi, Tohru; and Webb, Jimmy L., Re. 29,617, Cl. 260-49.000.

Pastoriza, James J., to Analog Devices, Incorporated. Constant-current digital-to-analog converter. Re. 29,619, Cl. 340-347.0DA.

Takekoshi, Tohru, to General Electric Company. Halovinylidene arylene polymers and process for making the same. Re. 29,616, Cl. 260-52.000.

Takekoshi, Tohru; and Webb, Jimmy L., to General Electric Company. Aryl methylene polymers prepared from chloral, bromal or glyoxalic acid. Re. 29,617, Cl. 260-49.000.

University of Minnesota, The Regents of the: *See—*
Bacaner, Marvin B., Re. 29,618, Cl. 424-316.000.

Webb, Jimmy L.: *See—*
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Swim, Herbert C.; and Ellis, Arnold W., 4,243, Cl. 11.000.

Ellis, Arnold W.: *See—*
Swim, Herbert C.; and Ellis, Arnold W., 4,243, Cl. 11.000.

Greinke, David, to Pan-American Plant Company. Chrysanthemum named Yellow Jacket. 4,244, 4-25-78, Cl. 75.000.

Pan-American Plant Company: *See—*
Greinke, David, 4,244, Cl. 75.000.

Swim, Herbert C.; and Ellis, Arnold W., to Armstrong Nurseries, Inc. Rose plant. 4,243, 4-25-78, Cl. 11.000.

LIST OF DESIGN PATENTEES

Albert, Gladys, to Albert, Gladys. Jewelry caddy. 247,761, 4-25-78, Cl. D6-132.000.

Alfred Dunhill Limited: *See—*
Weir, Robert James, 247,787, Cl. D27-36.000.

Barnich, Richard G.; and Johnson, Gary D., to Process Computer Systems, Inc. Desk top computer. 247,779, 4-25-78, Cl. D14-45.000.

Belkir, Marcel. Exerciser. 247,789, 4-25-78, Cl. D34-5.00K.

Bernyk, George S. Hair spray shield for attachment to spray cans. 247,788, 4-25-78, Cl. D28-9.000.

Blumberg, Armond. Lens cap retainer. 247,782, 4-25-78, Cl. D16-50.000.

Carbon, Fred S. Waffle baker. 247,763, 4-25-78, Cl. D7-87.000.

Carbon, Fred S. Waffle baker. 247,764, 4-25-78, Cl. D7-87.000.

Celotex Corporation, The: *See—*
Flood, David N., 247,786, Cl. D25-80.000.

Darrell, Jack. Push symbol for glass door or the like. 247,795, 4-25-78, Cl. D96-12.00C.

Davis, Ariel R.: *See—*
Topham, Silas Charles; and Davis, Ariel R., 247,773, Cl. D9-278.000.

DiLoreto, Edward, to Yale Engineering Company. Outer race for ball bearing. 247,781, 4-25-78, Cl. D15-143.000.

Ehrich, Robert D. Game call. 247,785, 4-25-78, Cl. D10-119.000.

Flood, David N., to Celotex Corporation, The. Roofing shingle. 247,786, 4-25-78, Cl. D25-80.000.

Fortune, William S. Self cleaning desoldering tool combination or the like. 247,766, 4-25-78, Cl. D8-51.000.

Ikeda, Kishio: *See—*
Tazawa, Keizaburo; Takahashi, Shinichiro; and Ikeda, Kishio, 247,794, Cl. D87-1.00D.

Jackson, Albert P. Combined golf ball marker and divot replacement tool. 247,790, 4-25-78, Cl. D34-5.0CB.

Johnson, Gary D.: *See—*
Barnich, Richard G.; and Johnson, Gary D., 247,779, Cl. D14-45.000.

Kawano, Takeyoshi, to Matsushita Electric Industrial Co., Ltd. Portable radio. 247,780, 4-25-78, Cl. D14-70.000.

Killian, Gerald I. Mounting plate for archery bow sights. 247,783, 4-25-78, Cl. D22-5.000.

Kim Craftsmen, Ltd.: *See—*
Moskowitz, Paul, 247,771, Cl. D9-191.000.

Kramer, Ralph. Cycle saddlebox. 247,776, 4-25-78, Cl. D12-158.000.

Lee, Richard J. Shotgun shell loading press. 247,784, 4-25-78, Cl. D22-99.000.

Lenoir, Kleber, to R. S. Furniture Inc. Shelf unit or similar article. 247,762, 4-25-78, Cl. D6-186.000.

Matay, Edward G. Novelty digit counter. 247,792, 4-25-78, Cl. D34-15.00R.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kawano, Takeyoshi, 247,780, Cl. D14-70.000.

McCarthy, Peter A. Coin container. 247,793, 4-25-78, Cl. D52-4.00R.

Monteleone, Salvatore. Golf putting head. 247,791, 4-25-78, Cl. D34-5.0GH.

Moskowitz, Paul, to Kim Craftsmen, Ltd. Display card for earrings or the like. 247,771, 4-25-78, Cl. D9-191.000.

Nagatomo, Daizi, to Sony Corporation. Tape cassette case. 247,778, 4-25-78, Cl. D14-11.000.

Pariente, Dorothy, to Pariente, Dorothy. Food service tray. 247,765, 4-25-78, Cl. D7-38.000.

Process Computer Systems, Inc.: *See—*
Barnich, Richard G.; and Johnson, Gary D., 247,779, Cl. D14-45.000.

R. S. Furniture Inc.: *See—*
Lenoir, Kleber, 247,762, Cl. D6-186.000.

Roberson, Donald. Housing for audio-visual entertainment system or similar article. 247,777, 4-25-78, Cl. D14-1.000.

Sagona, Charles. Plastic bottle. 247,767, 4-25-78, Cl. D9-130.000.

Sagona, Charles. Plastic bottle. 247,768, 4-25-78, Cl. D9-130.000.

Sagona, Charles. Plastic bottle. 247,769, 4-25-78, Cl. D9-156.000.

Sagona, Charles. Plastic bottle. 247,770, 4-25-78, Cl. D9-168.000.

Screenflow Accessories Limited: *See—*
Watson-O'Hara, Leonard, 247,775, Cl. D12-158.000.

Sexton, Edward William, Jr. Can. 247,772, 4-25-78, Cl. D9-218.000.

Sony Corporation: *See—*
Nagatomo, Daizi, 247,778, Cl. D14-11.000.
Tazawa, Keizaburo; Takahashi, Shinichiro; and Ikeda, Kishio, 247,794, Cl. D87-1.00D.

Takahashi, Shinichiro: *See—*
Tazawa, Keizaburo; Takahashi, Shinichiro; and Ikeda, Kishio, 247,794, Cl. D87-1.00D.

Tazawa, Keizaburo; Takahashi, Shinichiro; and Ikeda, Kishio, to Sony Corporation. Tape cassette case. 247,794, 4-25-78, Cl. D87-1.00D.

Topham, Silas Charles; and Davis, Ariel R. Dispenser cap. 247,773, 4-25-78, Cl. D9-278.000.

Underwood, Keith A. Wall plaque. 247,774, 4-25-78, Cl. D11-132.000.

Watson-O'Hara, Leonard, to Screenflow Accessories Limited. Motor cycle side pannier. 247,775, 4-25-78, Cl. D12-158.000.

Weir, Robert James, to Alfred Dunhill Limited. Lighter. 247,787, 4-25-78, Cl. D27-36.000.

Yale Engineering Company: *See—*
DiLoreto, Edward, 247,781, Cl. D15-143.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 25, 1978

NOTE.—First number, class; second number, subclass; third number, patent number

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27	4,085,560
32	4,085,564
35	4,085,561
59 R	4,085,562
	4,085,563
112 A	4,085,565
124 D	4,085,566
225	4,085,567
234	4,085,568
389	4,085,569

CLASS 55

48	4,086,069
97	4,086,070
501	4,086,071

CLASS 56

2	4,085,570
208	4,085,571
330	4,085,572
364	4,085,573

CLASS 57

68	4,085,574

CLASS 58

4 A	4,085,575
23 D	4,085,577
23 R	4,085,576

CLASS 60

39.02	4,085,578
39.04	4,085,579
39.65	4,085,580
39.66	4,085,581
203	4,085,582
204	4,085,583
250	4,085,584
262	4,085,585
277	4,085,586
403	4,085,587
517	4,085,588
626	4,085,589
673	4,085,590
674	4,085,591
676	4,085,593

CLASS 61

45 D	4,085,592

CLASS 62

2	4,086,072
171	4,085,594
476	4,085,595
	4,085,596

CLASS 65

30 E	4,086,073
31	4,086,074
40	4,086,075

CLASS 66

75.2	4,085,597
145 R	4,085,598

CLASS 70

14	4,085,599
39	4,085,600
364 R	4,085,601
456 B	4,085,602

CLASS 71

67	4,086,076
90	4,086,077
94	4,086,078
103	4,086,079
118	4,086,080
126	4,086,081

CLASS 72

41	4,085,603
50	4,085,604
54	4,085,605
60	4,085,606
77	4,085,607
297	4,085,608

CLASS 73

101	4,085,609
113	4,085,610
115	4,085,611
136 A	4,085,612
193 R	4,085,613
194 B	4,085,615
194 VS	4,085,614
215	4,085,616
362 CP	4,085,617
422 TC	4,085,618
462	4,085,619
727	4,085,620

CLASS 74

37	4,085,621
53	4,085,622
89.15	4,085,623
	4,085,624
89.22	4,085,625
110	4,085,626
574	4,085,627
579 E	4,085,628
625	4,085,629

CLASS 75

.5 A	4,086,082
64	4,086,083
118 R	4,086,084
124	4,086,085
130 R	4,086,086
200	4,086,087

CLASS 76

27	4,085,630

CLASS 81

3 R	4,085,631
3.3 R	4,085,632
111	4,085,633

CLASS 82

19	4,085,634

CLASS 83

13	4,085,635
56	4,085,636
69	4,085,637
71	4,085,638
157	4,085,639
198	4,085,640
328	4,085,641
764	4,085,642

CLASS 84

1.01	4,085,643
	4,085,644
	4,085,645
1.09	4,085,646
1.24	4,085,647
	4,085,648

CLASS 85

1 T	4,085,649
41	4,085,650
72	4,085,651
83	4,085,652

CLASS 89

7	4,085,653
191 A	4,085,654

CLASS 91

307	4,085,655
376 R	4,085,656
380	4,085,657
461	4,085,658

CLASS 92

8	4,085,659
119	4,085,660
170	4,085,661

CLASS 93

1 C	4,085,663
1 WZ	4,085,662
44.1 R	4,085,664

CLASS 96

1 R	4,086,088
27 R	4,086,089
35.1	4,086,090
36.2	4,086,091
86 P	4,086,093
86 R	4,086,092
100 R	4,086,094

CLASS 98

2.12	4,085,665
2.14	4,085,666
43 R	4,085,667

CLASS 99

483	4,085,668

CLASS 100

53	4,085,669

CLASS 101

76	4,085,670
128.1	4,085,671
169	4,085,672
242	4,085,673
248	4,085,674
269	4,085,675

CLASS 102

23	4,085,676
42 R	4,085,677
52	4,085,678
70 R	4,085,679
70.2 R	4,085,680

CLASS 104

23 FS	4,085,681

CLASS 105

157 R	4,085,682
424	4,085,683
482	4,085,684
498	4,085,685

CLASS 106

1.17	4,086,095
	4,086,096
64	4,086,097
97	4,086,098
109	4,086,099
291	4,086,100
293	4,086,123

CLASS 108

25	4,085,686

CLASS 109

24.1	4,085,687

CLASS 110

238	4,085,688
252	4,085,689

CLASS 112

158 E	4,085,691
158 R	4,085,690
275	4,085,692

CLASS 114

29	4,085,693
163	4,085,694
260	4,085,695
266	4,085,696

CLASS 115

1 R	4,085,697

CLASS 116

114 J	4,085,698

CLASS 118

37	4,085,700
57	4,085,701
60	4,085,702
500	4,085,699
504	4,085,703

CLASS 119

1	4,085,704
17	4,085,705
61	4,085,706

CLASS 122

4 D	4,085,707
7 B	4,085,708

CLASS 123

1 A	4,085,709
19	4,085,710
46 B	4,085,711
75 B	4,085,713
117 A	4,085,715
117 R	4,085,714
119 A	4,085,718
119 E	4,085,717
119 EC	4,085,716
122 E	4,085,719
127	4,085,720
136	4,085,721
139 AL	4,085,722
139 AW	4,085,723
140 MC	4,085,724
205	4,085,712

CLASS 126

110 B	4,085,725
110 R	4,085,726
121	4,085,727
270	4,085,728
	4,085,729
	4,085,730
271	4,085,731
	4,085,732
	4,085,733
	4,085,734
299 D	4,085,736
299 E	4,085,735

CLASS 128

2 F	4,085,737
2 N	4,085,738
2.05 R	4,085,740
2.08	4,085,741
2.1 B	4,085,739
4	4,085,742
6	4,085,743
69	4,085,744
165	4,085,745
166	4,085,746
214 F	4,085,747
215	4,085,748
	4,085,749
233	4,085,750
275	4,085,751
283	4,085,752
284	4,085,753
287	4,085,754
295	4,085,755
303.17	4,085,756
325	4,085,757
589	4,085,758

CLASS 131

25	4,085,759
268	4,085,760

CLASS 134

104	4,085,761

CLASS 135

4 R	4,085,762
69	4,085,763

CLASS 136

89 CC	4,086,102
89 CD	4,086,101

CLASS 137

68 R	4,085,764
	4,085,765
88	4,085,766
102	4,085,767
	4,085,768
119	4,085,769
238	4,085,770
344	4,085,771
464	4,085,772
561 A	4,085,776
571	4,085,773
625.3	4,085,774
625.5	4,085,775

CLASS 139

370.2	4,085,777

CLASS 140

93 A	4,085,778
	4,085,779

CLASS 141

1	4,085,780
	4,085,781
	4,085,782

CLASS 144

193 A	4,086,111
208 R	4,085,783

CLASS 145

29 R	4,085,784

CLASS 148

6.15 R	4,086,103
12 E	4,086,104
12 R	4,086,105
33	4,086,106
136	4,086,107
175	4,086,108
	4,086,109

CLASS 149

19.4	4,086,110

CLASS 150

.5	4,085,785

CLASS 152

158	4,085,786
362 R	4,085,787

CLASS 156

62.2	4,086,125

73.1 4,086,112
98 4,086,113
153 4,086,114
178 4,086,115
205 4,086,116
212 4,086,117
246 4,086,118
273 4,086,119
473 4,086,120
526 4,086,121
556 4,086,122
603 4,086,124
642 4,086,126
643 4,086,127
668 4,086,128

CLASS 160

133 4,085,788
135 4,085,789

CLASS 162

49 4,086,129
123 4,086,130
203 4,086,131

CLASS 164

7 4,085,790
55 4,085,791
72 4,085,792
436 4,085,793

CLASS 165

1 4,085,794
45 4,085,795

CLASS 166

77.5 4,085,796
245 4,085,797
252 4,085,798
272 4,085,799
288 4,085,800
295 4,085,801
4,085,802
303 4,085,803
315 4,085,804

CLASS 172

4.5 4,085,805
9 4,085,806

CLASS 174

14 R 4,085,807
15 C 4,086,425
68.5 4,086,426
88 C 4,086,427

CLASS 175

94 4,085,808
410 4,085,809

CLASS 176

30 4,086,132
4,086,133

CLASS 177

209 4,085,810
210 EM 4,085,811

CLASS 178

60 4,086,428
69.1 4,086,429
88 4,086,430

CLASS 179

1 CN 4,086,432
1 GQ 4,086,433
1 SA 4,086,431
1.5 R 4,086,435
2 AM 4,086,434
15 AF 4,086,436
4,086,437
18 BE 4,086,438
27 DA 4,086,439
27 G 4,086,446
81 R 4,086,440
84 C 4,086,441
90 BD 4,086,443
90 CS 4,086,442
99 4,086,444
121 R 4,086,445
170 NC 4,086,447
175.3 R 4,086,448
181 R 4,086,449
4,086,450

CLASS 180

6.48 4,085,812
14 A 4,085,813
33 C 4,085,814
54 R 4,085,815
64 A 4,085,816
132 4,085,817

CLASS 182

47 4,085,818
121 4,085,819
204 4,085,820

CLASS 184

15 A 4,085,821

CLASS 186

1 A 4,085,822

CLASS 187

29 R 4,085,823

CLASS 188

1 A 4,085,824
4,085,826
4,085,827
1 B 4,085,825
71.6 4,085,828
72.5 4,085,829
196 D 4,085,830
210 4,085,831
268 4,085,832

CLASS 192

4 B 4,085,833
87.13 4,085,834
113 AB 4,085,835

CLASS 195

1.2 4,086,134
17 4,086,135
29 4,086,136
4,086,137
65 4,086,138
66 B 4,086,140
66 R 4,086,139
81 4,086,141
103.5 R 4,086,142

CLASS 197

19 4,085,836
133 R 4,085,837
181 4,085,838

CLASS 198

410 4,085,839
472 4,085,840

CLASS 200

5 A 4,086,451
50 AA 4,086,452
52 R 4,086,453
60 4,086,454
76 4,086,455
82 E 4,086,456
84 R 4,086,457
85 R 4,086,458
144 B 4,086,459
146 R 4,086,460
148 R 4,086,461

CLASS 201

41 4,086,143
4,086,144

CLASS 202

248 4,086,145
4,086,231

CLASS 203

7 4,086,146
9 4,086,147

CLASS 204

33 4,086,148
59 R 4,086,149
95 4,086,150
159.16 4,086,151
176 4,086,152
181 R 4,086,153
195 R 4,086,154
266 4,086,155
290 F 4,086,157
294 4,086,156

CLASS 206

45.15 4,085,841
289 4,085,842
328 4,085,843
335 4,085,844
454 4,086,263
564 4,085,845
600 4,085,846
4,085,847

CLASS 208

264 4,086,158
333 4,086,159

CLASS 210

7 4,086,160
13 4,086,161
20 4,086,162
22 D 4,086,163
46 4,086,164
104 4,086,165
134 4,086,166
150 4,086,167
330 4,086,168
519 4,086,169

CLASS 211

45 4,085,848

CLASS 214

1 BB 4,085,849
2 4,085,850
10.5 R 4,085,851
17 R 4,085,852
77 R 4,085,853
138 D 4,085,855
138 R 4,085,854
145 A 4,085,856
302 4,085,857
303 4,085,858
450 4,085,859

CLASS 219

10.71 4,086,462
145.22 4,086,463
156 4,086,464
236 4,086,465
377 4,086,468
494 4,086,466
544 4,086,467

CLASS 220

89 B 4,085,860
90.4 4,085,861

CLASS 221

8 4,085,862
20 4,085,863
155 4,085,864

CLASS 222

1 4,085,865
158 4,085,866
181 4,085,867
193 4,085,868
271 4,085,869
361 4,085,870
404 4,085,871

CLASS 224

5 D 4,085,872
8 R 4,085,873
29 R 4,085,874
45 K 4,085,875
45 R 4,085,876
48 R 4,085,877

CLASS 225

19 4,085,878
93 4,085,879

CLASS 226

90 4,085,880
95 4,085,881

CLASS 227

110 4,085,882

CLASS 228

2.5 4,085,883

CLASS 229

17 R 4,085,885
17 S 4,085,884
62.5 4,085,886

CLASS 233

7 4,085,887
4,085,888
20 R 4,085,889

CLASS 235

92 DM 4,086,471
92 DN 4,086,472
92 DP 4,086,470
92 EA 4,086,473
92 MP 4,086,469
419 4,085,890
4,086,475
462 4,086,476
464 4,086,477
466 4,086,478

CLASS 236

15 A 4,085,891

CLASS 239

15 4,085,892
102 4,085,893
121 4,085,894
276 4,085,895
504 4,085,896

CLASS 241

18 4,085,897
175 4,085,898
247 4,085,899

CLASS 242

18 DD 4,085,900
18 G 4,085,901
43 R 4,085,902
43.1 4,085,903
54 R 4,085,904
107.4 A 4,085,905
192 4,085,906
199 4,085,907
201 4,085,908

CLASS 244

3.16 4,085,910
3.21 4,085,909
12.4 4,085,911
25 4,085,912

CLASS 246

63 A 4,085,913

CLASS 248

19 4,085,914
187 4,085,915
188 4,085,916
489 4,085,917

CLASS 249

11 4,085,918
134 4,085,919

CLASS 250

199 4,086,484
203 R 4,086,485
207 4,086,486
4,086,487
231 P 4,086,488
372 4,086,489
385 4,086,490
397 4,086,491
416 TV 4,086,492
468 4,086,493
505 4,086,494
561 4,086,495
4,086,496
562 4,086,497

CLASS 251

57 4,085,920
129 4,085,921
298 4,085,952

CLASS 252

33 4,086,170
4,086,171
47.5 4,086,172
51.5 A 4,086,173
62.56 4,086,174
OP 4,086,175
100 4,086,176
102 4,086,177
143 4,086,178
171 4,086,179
4,086,180
180 4,086,181
182 4,086,182
414 4,086,184
429 B 4,086,185
430 4,086,186
454 4,086,264
455 Z 4,086,187
463 4,086,188
519 4,086,189

CLASS 254

10 C 4,085,953

CLASS 256

34 4,085,954

CLASS 260

2 S 4,086,190
2.5 AJ 4,086,194
2.5 AY 4,086,193
2.5 B 4,086,191
2.5 FP 4,086,192
2.5 N 4,086,195
18 PN 4,086,197
23.7 C 4,086,198
29.6 S 4,086,200
29.7 S 4,086,201
29.7 UP 4,086,199
33.2 R 4,086,202
40 R 4,086,203
45.8 N 4,086,207
45.8 NT 4,086,204
4,086,206
45.8 R 4,086,205
47 C 4,086,208
49 Re.29,617
4,086,209
52 Re.29,616
67 R 4,086,210
75 NA 4,086,211
75 R 4,086,212
77.5 AB 4,086,213
77.5 AN 4,086,214
78 R 4,086,215
112 B 4,086,218
112 R 4,086,216
4,086,217
112.5 LH 4,086,219
112.5 R 4,086,196
4,086,220
112.5 T 4,086,221
122 4,086,222
151 4,086,223
192 4,086,224
239 B 4,086,227
239 BF 4,086,226
239 HM 4,086,228
239.3 P 4,086,225
243.3 4,086,230
250 Q 4,086,232
256.4 C 4,086,233
268 BC 4,086,234
270 D 4,086,229
287 AN 4,086,236
290 P 4,086,237
306.8 D 4,086,238
4,086,241
306.8 R 4,086,239
4,086,240
308 B 4,086,242
325 PH 4,086,243
340.3 4,086,244
4,086,245
340.9 R 4,086,246
343.6 4,086,247
345.2 4,086,248
345.5 4,086,249
346.6 4,086,250
346.74 4,086,251
376 4,086,252
396 N 4,086,253
397.45 4,086,254
397.6 4,086,255
400 4,086,256
403 4,086,257
408 4,086,258
413 4,086,259
448.8 R 4,086,260
449 M 4,086,261
449.6 R 4,086,262
455 A 4,086,265
465.4 4,086,266
514 D 4,086,269
515 P 4,086,270
555 A 4,086,271
559 D 4,086,272
561 N 4,086,275
561 S 4,086,273
4,086,274
563 R 4,086,276
591 4,086,277
609 R 4,086,278
615 B 4,086,279
617 R 4,086,280
621 H 4,086,282
621 R 4,086,281
626 T 4,086,283
666 PY 4,086,284
4,086,285
4,086,286
671 M 4,086,289
671 R 4,086,287
4,086,288
680 E 4,086,290
758 4,086,291
830 R 4,086,293
831 4,086,292
834 4,086,294
857 G 4,086,296
857 L 4,086,295
859 PV 4,086,297
880 B 4,086,298
885 4,086,299
4,086,300
897 A 4,086,301
926 4,086,302
928 4,086,303
989 4,086,304

CLASS 261

30 4,086,305
93 4,086,306
97 4,086,307
124 4,086,308

CLASS 264

35 4,086,309
41 4,086,310
43 4,086,311
46.6 4,086,312
70 4,086,313
89 4,086,314
97 4,086,315
120 4,086,316
134 4,086,317
135 4,086,318

CLASS 266

90 4,085,922
215 4,085,923
241 4,085,924

CLASS 267

64 R 4,085,925

CLASS 269

295 4,085,926

CLASS 270

54 4,085,927
61 R 4,085,928

CLASS 271

122 4,085,929
204 4,085,930
265 4,085,931

CLASS 272

8 P 4,085,932

CLASS 273

95 R 4,085,933
171 4,085,934
185 D 4,085,935
186 A 4,085,936
218 4,085,937
279 4,085,938

CLASS 274

1 R 4,085,939
15 R 4,085,940

CLASS 277

3 4,085,941
30 4,085,942

CLASS 279

1 K 4,085,943

CLASS 280

11.12 4,085,944
106.5 R 4,085,945
289 WC 4,085,946
607 4,085,947
682 4,085,948

CLASS 282

27.5 4,085,949

CLASS 285

45 4,085,950
334 4,085,951

CLASS 290

55 4,086,498

CLASS 293

86 4,085,956
88 4,085,957

CLASS 294

97 4,085,958

CLASS 296

23 MC 4,085,959
28 C 4,085,960
37.6 4,085,961
65 A 4,085,963
65 R 4,085,962
91 4,085,964
137 F 4,085,965
146 4,085,966

CLASS 297

115 4,085,967
243 4,085,968
367 4,085,969
440 4,085,970

CLASS 299

4 4,085,971
7 4,085,972
8 4,085,973
53 4,085,974

CLASS 302

23 4,085,975
25 4,085,976
28 4,085,977

CLASS 303

6 C 4,085,978
92 4,085,979

CLASS 307

88 ET 4,086,499
270 4,086,500
299 R 4,086,501
308 4,086,502
363 4,086,503

CLASS 308

20 4,085,981
76 4,085,982
134.1 4,085,983
205 4,085,980
207 A 4,085,984

CLASS 310

74 4,086,505
4,086,506
86 4,086,508
88 4,086,507
232 4,086,509
242 4,086,510

CLASS 312

216 4,085,985
236 4,085,986
269 4,085,987

CLASS 313

101 4,086,511
366 4,086,512
414 4,086,513
500 4,086,514

CLASS 315

10 4,086,515
169 R 4,086,516

CLASS 318

39 4,086,517
127 4,086,518
254 4,086,519
269 4,086,520
307 4,086,521
568 4,086,522

CLASS 320

2 4,086,523
33 4,086,524
4,086,525

CLASS 323

34 4,086,526

CLASS 324

61 R 4,086,528
127 4,086,529
133 4,086,530
158 MG 4,086,531
166 4,086,532
208 4,086,533
233 4,086,527

CLASS 325

15 4,086,534
128 4,086,535
137 4,086,536
478 4,086,537

CLASS 328

112 4,086,538
155 4,086,539
167 4,086,540

CLASS 330

51 4,086,541
268 4,086,542
287 4,086,543

CLASS 331

1 A 4,086,544
16 4,086,545

CLASS 333

81 R 4,086,546
4,086,547
4,086,548

CLASS 335

18 4,086,549
132 4,086,550

CLASS 336

45 4,086,551
119 4,086,552
192 4,086,553

CLASS 337

102 4,086,558

CLASS 338

2 4,086,554
15 4,086,555
22 R 4,086,559
35 4,086,556
42 4,086,557

CLASS 339

14 R 4,085,988
59 M 4,085,989
74 R 4,085,990
75 P 4,085,991
91 R 4,085,992
94 M 4,085,993
95 R 4,085,994
97 R 4,085,995
159 C 4,085,996
255 P 4,085,997
258 P 4,085,998

CLASS 340

3 R 4,086,560
7 PC 4,086,561
15.5 TS 4,086,504
52 B 4,086,563
52 H 4,086,562
58 4,086,564
81 R 4,086,565
146.1 AB 4,086,566
146.3 SY 4,086,567
147 R 4,086,568
167 R 4,086,569
172 4,086,570
213 R 4,086,573
227 R 4,086,574
258 B 4,086,586
259 4,086,575
272 4,086,576
306 4,086,577
324 AD 4,086,578
4,086,579
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49 : 4,085,493
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50 : 4,085,653
4,085,680
51 : 4,085,663
4,085,667
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4,085,744
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4,085,784
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4,085,873
4,085,875
53 : 4,085,495
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4,085,997
4,086,049
4,086,111
4,086,129
4,086,154
4,086,323
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4,086,444
4,086,544
4,086,632
54 : 4,086,293
4,086,294
55 : 4,085,821
4,085,831
4,085,834
4,085,874
4,086,130
4,086,131
4,086,454
4,086,494
56 : 4,085,863

DESIGN PATENTS

6 : 247,766
247,781
247,788
247,791
12 : 247,767

247,768
247,769
247,770
247,786
17 : 247,792

18 : 247,785
19 : 247,790
25 : 247,772
26 : 247,763
247,764

247,779
34 : 247,793
36 : 247,761
247,765
247,771

247,782
39 : 247,789
247,774
247,776
247,777

41 : 247,783
48 : 247,795
49 : 247,773
55 : 247,784

PLANT PATENTS

6 : 4,243

12 : 4,244

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